

ADMINISTRATIVE RECORD
SF FILE NUMBER



Engineers
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0C80160

Rec'd 1/4/89 SB

1070102

1264380 - R8 SDMS

This pkg. will be relayed
to Jon Nickel with the
suggestion that it should
be shared with Bob Miller
and Kevin Harvey.

MEMORANDUM

JAN 04 1989

INTERSTATE OFFICE

DATE: December 27, 1988
TO: D. Scott Brown/USEPA
FROM: Dave Bunte/CH2M HILL *DJB*
SUBJECT: East Helena Data Quality Review -- Comparison of ASARCO
Laboratory Data to CLP Results
PROJECT: BOI64481.PN

I have attached a memo from Dennis Neuman dated December 9, 1988 that summarizes the statistical comparisons of the ASARCO laboratory data to the contract laboratory program (CLP) results on splits of the ASARCO samples. MSU conducted paired comparison tests (paired t-tests) and linear regressions on the two sets of data.

These statistical analyses were conducted on selected analyses for garden vegetables, process waters, soils, ground water and surface water. We have not yet received ASARCO's data for cattle tissue, wheat grain or fish tissue; hence, these comparisons were not conducted. The attached memo is an interim report on the status of the data comparisons.

The paired t-tests were used to determine if there were significant differences between the two data sets. This test actually determines whether or not the mean of the differences between pairs is significantly different than zero. The results showed that for certain media, such as the soils, there were no differences at the 95 percent confidence level. For process waters, only one parameter, dissolved copper, was significantly different between the two data sets. However, the other media (garden vegetables, ground water and surface water) showed significant differences for larger numbers of parameters.

The garden vegetable results showed that there were significant differences between the ASARCO and CLP results for zinc and mercury. Also, the lead values were negatively correlated between the two data sets. Based on previous reviews, we had been aware of the discrepancies in the lead and mercury values. The average difference between the pairs for the zinc analysis was 15.6 mg/kg on a dry weight basis with the average ASARCO result (87.1 mg/kg) being higher than the average CLP result (71.6 mg/kg).

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Although this difference is significant at the 95 percent confidence level, the magnitude of this difference may or may not have an impact on the final data interpretation. This will need to be considered when the data is used.

The statistical analysis for the ground water data showed that there were significant differences between the two data bases for arsenic, copper and lead. This finding was a concern especially for the arsenic, since this is the parameter of greatest interest. The statistical analysis that was run used all of the ground water data including both on- and off-site wells. The average difference between the ASARCO data and the CLP data was 2.3 mg/l with an ASARCO average of 33.0 mg/l and a CLP average of 30.6 mg/l. These values are strongly influenced by the high concentration wells on the plant site.

The statistics were rerun on arsenic in ground water using only the values less than 0.5 mg/l, as described in Dennis Neuman's memo received December 21, 1988. This was done because small variations in these low concentrations are probably more important than small variations at the higher concentrations. When the statistics were rerun for the low arsenic concentration range, there was no significant difference between the ASARCO mean (0.045mg/l) and the CLP mean (0.030 mg/l).

The statistical analysis for surface water showed that there were significant differences at the 95 percent confidence level between the ASARCO analyses and the CLP analyses for total lead and zinc and for dissolved iron, lead, zinc and sulfate. In many cases, although there were statistically significant differences, the average differences were relatively small. These findings will need to be reviewed with respect to the final use of the data to determine the impact of these results.

In summary, there are some media that have significant differences between the ASARCO and CLP results for certain parameters. These differences could be due to differences in analytical methods or for some media, such as garden vegetables, differences in the actual samples submitted. It is important to note that in some cases the ASARCO results are higher than the CLP and in other cases the CLP is higher. These are significant findings that will need to be considered during data interpretation.

Please review the attached and let me know if you have any comments.

Attachments

cc: Dennis Neuman/MSU (w/o attachments)
Doug Rogness/MDHES

EHSB18

Attachment



RECLAMATION RESEARCH UNIT

COLLEGE OF AGRICULTURE
MONTANA STATE UNIVERSITY, BOZEMAN 59717

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MEMORANDUM

TO: Dave Bunte, CH2M HILL
 FROM: Dennis Neuman, MSU *Dennis Neuman*
 DATE: December 9, 1988
 RE: Status of ASARCO, East Helena Data Quality Report:
 Task Order No. 22

American Smelting and Refining Company (ASARCO) is actively pursuing additional RI/FS studies at the East Helena Smelter CERCLA site. These studies have focused on the collection and analyses of environmental samples including soil (offsite and onsite), ground and surface waters, plant process waters, garden vegetables, wheat grain, cattle tissues (liver, kidney and muscle), and fish. While ASARCO was collecting these samples, splits of some samples were obtained and submitted to CLP laboratories for analyses. The main portion of these environmental samples have been analyzed by ASARCO analytical laboratories. The scope of work defined in this Task Order is to review ASARCO's validated data packages and to statistically compare the two data bases for several parameters of prime importance. These parameters are arsenic (As), cadmium (Cd), copper (Cu), lead (Pb), iron (Fe), zinc (Zn), and sulfate (SO_4) in process waters, surface waters and ground waters; levels of As, Cd, Cu, Pb and Zn found in soils, garden vegetables, and fish fillets; concentrations of As, Cd, Pb and Zn exhibited in cattle tissues; and levels of As, Cd, Cu, Pb, Zn, mercury (Hg), silver (Ag), manganese (Mn), selenium (Se), thallium (Tl) and antimony (Sb) in wheat grain samples.

ASARCO data relating to these environmental samples have been submitted to EPA except for cattle tissues, wheat grain and fish. Data generated by the CLP laboratories have been

submitted and have been validated using EPA guidance. Results of the validation activities for the CLP data are retained by CH2M HILL. The ASARCO data have received various levels of review and validation. Three significant ASARCO validation documents were submitted to EPA: "Data Validation Summary for the ASARCO East Helena Remedial Investigation/Feasibility Study" (Hydrometrics, 1988); "Data Validation and Reduction Report: ASARCO East Helena Phase II RI Soils Data" (Weston, 1988a) and "Data Validation and Reduction Report: ASARCO East Helena Phase II RI Garden Vegetable Data" (Weston, 1988b). These documents have been reviewed by Reclamation Research Unit (MSU) and comments were submitted to CH2M HILL. The ASARCO data packages were also reviewed by Systems Technology and by MSU. These comments have also been submitted to CH2M HILL.

Data bases containing ASARCO and CLP data for each matrix type were generated in a joint effort by Systems Technology and OEA Research under the direction of CH2M HILL.

To date the following five data bases are completed: ground waters, process waters, soil core, garden vegetables, and surface waters.

Files of paired samples for each matrix type were created from the original data bases and are shown in the attached information. Analytical data in these files were reviewed for obvious anomalies and these were verified using data sample sheets. Analytical data were then screened for values reported as less than the instrument detection limit, values that were rejected as unusable, and for missing values. A third set of files (see attached information) was generated with these analytical values removed. These remaining analytical values, including estimated levels, were subjected to paired comparisons test (paired t-test) and linear regression analysis using MSUSTATS software.

The t-test for paired comparisons evaluates whether the mean of the sample differences between pairs of analyte concentrations is different from a hypothetical mean, which the null hypothesis sets at zero. The paired values were individual analyte concentrations reported by ASARCO and the CLP laboratories. Linear regression analysis was used to compare the paired values and to identify any systematic errors. Calculations of the slope, the intercept and the product-moment correlation coefficient (r) of each regression line were performed. If each laboratory reported identical analyte concentrations, the regression line will have a zero intercept and a slope and correlation coefficient of one. Tests for an intercept differing significantly from zero, and a slope differing significantly from one were also performed for each regression line.

The results of these statistical tests are exhibited for each analyte of interest for each of the five matrices in Tables 1 through 5. Information in these tables is arranged by parameter, analysis type, total number of paired samples, number of evaluated pairs and the statistical results for the paired t-test and the regression analysis. Table 1 displays results for garden vegetables. For the elements Cd and Cu, no significant differences were found between the pairs, slopes were not significantly different ($p \leq 0.05$) from one and the intercepts were not significantly different ($p \leq 0.05$) from zero. Paired levels of Zn were significantly different with ASARCO measured values generally higher than those measured by the CLP laboratory. The slope of the Zn regression line is also significantly different from one. The statistical analysis of the Hg and Pb data revealed negative correlations, negative slopes, and intercepts significantly different from zero. These Hg and Pb data do not appear to be related. There were insufficient pairs of As - vegetable data for statistical analysis.

Table 2 shows the paired t-test and regression statistics for parameters evaluated in process waters. Only dissolved Cu revealed significant differences between pairs of analytical levels. Nearly all regression lines exhibited slopes which are different from one.

Table 3 shows the paired t-test and regression statistics for metals and As evaluated from the soil core data base. The mean differences for As, Cd, Pb and Zn indicated that the CLP results are higher than values measured by ASARCO's laboratory. Levels of Cu reported by ASARCO were higher. Although the paired t-tests revealed no significant differences, all of the calculated regression line slopes were significantly different from one.

Statistical results for constituents evaluated in ground water samples are shown in Table 4. Levels of dissolved As, Cu and Pb were significantly different between data bases. Regression line slopes were significantly different from one for As, Cd, Fe and SO_4 .

Table 5 gives the paired t-test and regression statistics for metals, arsenic, and sulfate in surface water. Several parameters have slopes different than one, intercepts different from zero, and significant paired t-test results.

Additional tables similar to these will be generated for cattle tissue data, wheatgrain data, and fish data when information becomes available. A more detailed interpretation of the statistical tests, as well as an in-depth discussion of the data validation reviews, will also be included in the data quality report.

There are some concerns about the inconsistent flagging of data qualifiers. The data bases provided to us by EOA Associates do not have the same sample data qualifiers as those reported by WESTON (garden vegetables and soils data validation documents) or by Hydrometrics (water, soil data validation document). EOA Associates have also applied a different QA/QC code system to data generated by the CLP laboratories and validated by CLP data reviewers.

Table 1. Paired t-test statistics and linear regression statistics for garden vegetable data. East Helena Smelter Site.

| Parameter | Analysis | Type | Total # of Pairs | Evaluated # of Pairs | PAIRED T-TEST STATISTICS | | | | | | LINEAR REGRESSION STATISTICS | | | | | |
|----------------------|----------|------|------------------------|----------------------------|--------------------------|-----------------------|--------------------------------|-----------------------|-----------------------|---------|------------------------------|-------------|--------------------|-------------|--------------------|-------------|
| | | | | | Mg/Kg | | | Upper 95% Conf. | Lower 95% Conf. | t | P-Value | Slope | | | Intercept | |
| | | | | | CLP \bar{x}_1 | ASARCO \bar{x}_2 | D $(\bar{x}_1 - \bar{x}_2)$ | Limit | Limit | | | r | Value | 95% C.L. | Value | 95% C.L. |
| Arsenic ¹ | Total | | 10 | 4 | 2.182 | 3.402 | -1.220 | | | -0.3977 | -0.216 | ± 1.513 | | 2.916 | | |
| Cadmium | Total | | 10 | 8 | 6.215 | 5.235 | 0.980 | 2.181 | -0.221 | 1.929 | 0.0951 | 0.9883 | 1.127 | ± 0.174 | 0.317 | ± 1.417 |
| Copper | Total | | 10 | 9 | 13.21 | 13.33 | -0.122 | 2.311 | -2.556 | -0.1158 | 0.9107 | 0.8998 | 1.063 | ± 0.441 | -0.963 | ± 6.687 |
| Lead | Total | | 10 | 9 | 34.02 | 10.09 | 23.93 | 52.81 | -4.946 | 1.911 | 0.0924 | -0.3440 | -0.96133 | ± 2.247 | 43.73 ^a | ± 34.68 |
| Mercury | Total | | 10 | 7 | 0.7586 | 0.0900 | 0.669 | 0.9932 | 0.344 | 5.040 | 0.0024* | -0.0541 | -0.213 | ± 4.525 | 0.778 ^a | ± 0.541 |
| Zinc | Total | | 10 | 9 | 71.56 | 87.11 | -15.56 | -0.1338 | -30.98 | -2.326 | 0.0485* | 0.9988 | 0.862 [#] | ± 0.037 | -3.533 | ± 6.051 |

¹ - Sample size too small for analysis.

* - Pairs are significantly different at $p \leq 0.05$.

- Slope is significantly different than 1 at $p \leq 0.05$.

^a - Intercept is significantly different than 0 at $p \leq 0.05$.

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Table 2. Paired t-test statistics and linear regression statistics for process waters. East Helena Smelter Site.

| Parameter | Analysis | Type | Total | # of Pairs | # of Pairs | PAIRED T-TEST STATISTICS | | | | | | LINEAR REGRESSION STATISTICS | | | | | | | |
|-----------|----------|------|-------|------------|------------|--------------------------|--------------------|-----------------------------|-------------|-------------|-----------------|------------------------------|--------|---------|-------------|--------------------|--------------|-----------|----------|
| | | | | | | Mg/L | | | Upper | Lower | 95% Conf. Limit | 95% Conf. Limit | t | P-Value | r | Slope | | Intercept | |
| | | | | | | CLP \bar{x}_1 | ASARCO \bar{x}_2 | D $(\bar{x}_1 - \bar{x}_2)$ | Conf. Limit | Conf. Limit | | | | | | Value | 95% C.L. | Value | 95% C.L. |
| Arsenic | Total | | 56 | 42 | | 524.1 | 538.4 | -14.28 | 54.62 | -83.17 | -0.4185 | 0.6778 | 0.9800 | 0.923# | ± 0.060 | 27.12 | ± 72.21 | | |
| Arsenic | Diss. | | 56 | 35 | | 553.6 | 585.1 | -31.54 | 10.32 | -73.40 | -1.531 | 0.1350 | 0.9958 | 0.942# | ± 0.031 | 2.18 | ± 39.63 | | |
| Cadmium | Total | | 56 | 38 | | 32.20 | 34.42 | -2.218 | 1.489 | -5.925 | -1.212 | 0.2331 | 0.9975 | 0.911# | ± 0.022 | 0.860 | ± 2.333 | | |
| Cadmium | Diss. | | 56 | 34 | | 31.78 | 36.29 | -4.516 | 4.053 | -13.09 | -1.072 | 0.2914 | 0.9914 | 0.790# | ± 0.038 | 3.107 | ± 4.105 | | |
| Copper | Total | | 56 | 34 | | 0.9168 | 1.339 | -0.423 | -0.1649 | -0.680 | -3.336 | 0.0021* | 0.9582 | 0.680# | ± 0.073 | 0.006 | ± 0.1711 | | |
| Copper | Diss. | | 56 | 33 | | 0.0726 | 0.0644 | 0.008 | 0.0325 | -0.016 | 0.6935 | 0.4930 | 0.9838 | 1.349# | ± 0.090 | -0.0142 | ± 0.0153 | | |
| Iron | Total | | 56 | 39 | | 5.532 | 5.356 | 0.176 | 0.9239 | -0.572 | 0.4765 | 0.6364 | 0.9771 | 0.893# | ± 0.065 | 0.749 | ± 0.750 | | |
| Iron | Diss. | | 56 | 31 | | 4.962 | 4.172 | 0.790 | 1.629 | -0.049 | 1.923 | 0.0640 | 0.9844 | 1.119# | ± 0.076 | 0.293 | ± 0.8001 | | |
| Lead | Total | | 56 | 37 | | 18.97 | 34.40 | -15.43 | 6.168 | -37.02 | -1.449 | 0.1560 | 0.9945 | 0.532# | ± 0.019 | 0.686 | ± 2.687 | | |
| Lead | Diss. | | 56 | 31 | | 2.651 | 2.813 | -0.162 | 0.4980 | -0.821 | -0.5007 | 0.6202 | 0.9640 | 0.923 | ± 0.097 | 0.054 | ± 0.698 | | |
| Zinc | Total | | 56 | 38 | | 18.52 | 21.22 | -2.702 | 0.4492 | -5.854 | -1.737 | 0.0906 | 0.9890 | 0.908# | ± 0.046 | -0.752 | ± 2.820 | | |
| Zinc | Diss. | | 56 | 36 | | 19.59 | 18.82 | 0.769 | 3.067 | -1.530 | 0.6791 | 0.5016 | 0.9960 | 1.079# | ± 0.034 | -0.7191 | ± 1.916 | | |
| Sulfate | Diss. | | 56 | 29 | | 1018. | 1178. | -159.6 | 120.1 | -439.2 | -1.169 | 0.2523 | 0.7990 | 0.459# | ± 0.137 | 477.1 ^a | ± 222.5 | | |

* - Pairs are significantly different at $p \leq 0.05$.

- Slope is significantly different than 1 at $p \leq 0.05$.

^a - Intercept is significantly different than 0 at $p \leq 0.05$.

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Table 3. Paired t-test statistics and linear regression statistics for soil core data. East Helena Smelter Site.

| Parameter | Analysis Type | Total Pairs | # of Pairs | PAIRED T-TEST STATISTICS | | | | | | LINEAR REGRESSION STATISTICS | | | | | |
|-----------|---------------|-------------|------------|--------------------------|--------------------|-----------------------------|-----------------------|-----------------------|---------|------------------------------|--------|--------------------|--------------|-----------|--------------|
| | | | | Mg/Kg | | | Upper 95% Conf. Limit | Lower 95% Conf. Limit | t | P-Value | r | Slope | | Intercept | |
| | | | | CLP \bar{x}_1 | ASARCO \bar{x}_2 | D $(\bar{x}_1 - \bar{x}_2)$ | | | | | | Value | 95% C.L. | Value | 95% C.L. |
| Arsenic | Total | 82 | 80 | 1085. | 783.4 | 301.9 | 967.3 | -363.3 | 0.9033 | 0.3691 | 0.9105 | 1.684 [#] | ± 0.171 | -233.9 | ± 517.0 |
| Cadmium | Total | 82 | 58 | 440. | 265. | 175.0 | 508.5 | -158.5 | 1.051 | 0.2978 | 0.9925 | 1.980 [#] | ± 0.066 | -84.74 | ± 86.40 |
| Copper | Total | 82 | 67 | 673.2 | 754.4 | -81.19 | 326.3 | -488.7 | -0.3978 | 0.6921 | 0.8099 | 0.775 [#] | ± 0.139 | 88.31 | ± 395.59 |
| Lead | Total | 82 | 81 | 3262. | 2052. | 1210.0 | 2738. | -318.7 | 1.575 | 0.1192 | 0.8610 | 1.917 [#] | ± 0.252 | -670.7 | ± 1304.0 |
| Zinc | Total | 82 | 82 | 3563. | 2657. | 905.7 | 2013. | -201.5 | 1.628 | 0.1075 | 0.8826 | 1.270 [#] | ± 0.1493 | 188.8 | ± 1109.2 |

- Slope is significantly different than 1 at p ≤ 0.05.

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Table 4. Paired t-test statistics and linear regression statistics for ground water data. East Helena Smelter Site.

| Parameter | Analysis | Type | Total # of Pairs | Evaluated # of Pairs | PAIRED T-TEST STATISTICS | | | | | | LINEAR REGRESSION STATISTICS | | | | | | |
|-----------|----------|------|------------------------|----------------------------|--------------------------|-----------------------|--------------------------------|--------------------|-----------------------|----------------|------------------------------|--------|---------|-------------|---------------------|---------------|----------|
| | | | | | Mg/L | | | Upper 95% | Lower 95% | Conf. Limit | Conf. Limit | t | P-Value | Slope | | Intercept | |
| | | | | | CLP \bar{x}_1 | ASARCO \bar{x}_2 | D $(\bar{x}_1 - \bar{x}_2)$ | CLP \bar{x}_1 | ASARCO \bar{x}_2 | | | | | Value | 95% C.L. | Value | 95% C.L. |
| Arsenic | Diss. | | 151 | 77 | 30.61 | 32.95 | -2.332 | -0.2501 | -4.414 | -2.231 | 0.0286* | 0.9926 | 0.936# | ± 0.026 | -0.208 | ± 2.023 | |
| Cadmium | Diss. | | 151 | 37 | 0.8871 | 0.7393 | 0.148 | 0.3235 | -0.028 | 1.707 | 0.0964 | 0.9795 | 1.159# | ± 0.082 | 0.0303 | ± 0.160 | |
| Copper | Diss. | | 151 | 32 | 0.0431 | 0.0301 | 0.013 | 0.0200 | 0.006 | 3.786 | 0.0000* | 0.9226 | 1.023 | ± 0.159 | 0.0123 ^a | ± 0.0086 | |
| Lead | Diss. | | 151 | 20 | 0.0363 | 0.0293 | 0.007 | 0.0132 | 0.010 | 2.387 | 0.0276* | 0.9359 | 1.109 | ± 0.207 | 0.00385 | ± 0.00864 | |
| Iron | Diss. | | 151 | 72 | 10.99 | 10.21 | 0.774 | 1.652 | -0.104 | 1.758 | 0.0831 | 0.9882 | 1.113# | ± 0.041 | -0.379 | ± 0.851 | |
| Zinc | Diss. | | 151 | 106 | 3.433 | 3.423 | 0.010 | 0.0985 | -0.079 | 0.2149 | 0.8303 | 0.9989 | 0.981 | ± 0.009 | 0.0755 | ± 0.0883 | |
| Sulfate | Diss. | | 151 | 100 | 568.2 | 638.1 | -69.89 | 67.94 | -207.7 | -1.006 | 0.3168 | 0.7910 | 0.495# | ± 0.076 | 252.1 ^a | ± 97.1 | |

* - Pairs are significantly different at $p \leq 0.05$.

- Slope is significantly different than 1 at $p \leq 0.05$.

^a - Intercept is significantly different than 0 at $p \leq 0.05$.

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Table 5. Paired t-test statistics and linear regression for surface water. East Helena Smelter Site.

| Parameter | Analysis | Type | | | | PAIRED T-TEST STATISTICS | | | | LINEAR REGRESSION STATISTICS | | | | | | | |
|----------------------|----------|------|-------|------------|-----------|--------------------------|-------------|---------------------------|-------------|------------------------------|--------|---------|--------|--------|--------------|----------------------|---------------|
| | | | Total | # of Pairs | Evaluated | Mg/L | | | Upper 95% | Lower 95% | t | P-Value | r | Slope | | Intercept | |
| | | | | | | CLP | ASARCO | D | Conf. Limit | Conf. Limit | | | | Value | 95% C.L. | Value | 95% C.L. |
| | | | | | | \bar{x}_1 | \bar{x}_2 | $(\bar{x}_1 - \bar{x}_2)$ | | | | | | | | | |
| Arsenic | Total | | 34 | 21 | | 0.0161 | 0.0144 | 0.002 | 0.0059 | -0.002 | 0.8619 | 0.3990 | 0.4186 | 0.547 | ± 0.570 | 0.00822 | ± 0.0255 |
| Arsenic | Diss. | | 34 | 14 | | 0.0155 | 0.0148 | 0.001 | 0.0039 | -0.003 | 0.4387 | 0.6681 | 0.7763 | 0.914 | ± 0.467 | 0.00194 | ± 0.00771 |
| Cadmium | Total | | 34 | 6 | | 0.0033 | 0.0015 | 0.002 | 0.0044 | -0.001 | 1.784 | 0.1345 | 0.5280 | 1.757 | ± 3.922 | 0.00065 | ± 0.00660 |
| Cadmium ¹ | Diss. | | 34 | 3 | | 0.0087 | 0.0010 | 0.008 | | | | | | | | | |
| Iron | Total | | 34 | 30 | | 0.3226 | 0.3160 | 0.007 | 0.0382 | -0.025 | 0.4242 | 0.6745 | 0.7866 | 0.828 | ± 0.252 | 0.0608 | ± 0.0855 |
| Iron | Diss. | | 34 | 18 | | 0.0557 | 0.0731 | -0.017 | -0.0087 | -0.026 | -4.213 | 0.0000* | 0.4773 | 0.306# | ± 0.299 | 0.0333 ^a | ± 0.0226 |
| Lead | Total | | 34 | 25 | | 0.0305 | 0.0168 | 0.014 | 0.0247 | 0.003 | 2.572 | 0.0167* | 0.2439 | 0.991 | ± 1.701 | 0.0139 | ± 0.0307 |
| Lead | Diss. | | 34 | 9 | | 0.0035 | 0.0098 | -0.006 | -0.0021 | -0.010 | -3.478 | 0.0083* | 0.2231 | 0.877# | ± 0.3280 | 0.00264 | ± 0.00379 |
| Zinc | Total | | 34 | 29 | | 0.0692 | 0.0574 | 0.012 | 0.0212 | 0.003 | 2.613 | 0.0143* | 0.2696 | 0.436 | ± 0.615 | 0.0442 ^a | ± 0.0364 |
| Zinc | Diss. | | 34 | 28 | | 0.0350 | 0.0368 | -0.002 | 0.0000 | -0.004 | -2.072 | 0.0479* | 0.9690 | 0.810# | ± 0.083 | 0.00522 ^a | ± 0.00332 |
| Sulfate | Diss. | | 34 | 21 | | 34.76 | 39.14 | -4.381 | -0.0776 | -8.684 | -2.124 | 0.0464* | 0.7684 | 1.406 | ± 0.565 | -20.26 | ± 22.40 |

¹ - Sample size equals 3, statistics not calculated.

* - Pairs are significantly different at $p \leq 0.05$.

- Slope is significantly different than 1 at $p \leq 0.05$.

^a - Intercept is significantly different than 0 at $p \leq 0.05$.

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**Garden Vegetable Data
East Helena Smelter Site**

Full Data Base

Table 1. Garden vegetable data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASARCO for the parameters As, Cd and Cu. The full data base is shown.

| Sample ID | Site Number | CLP Number | Sample Type | CLP As (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO As (mg/kg) | ASRCO Rev. | CLP Cd (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Cd (mg/kg) | ASRCO Lab Codes | CLP Cu (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Cu (mg/kg) | ASRCO Lab Codes |
|--------------|----------------|---------------|----------------|----------------------|---------------------|-------------|------------------------|---------------|----------------------|---------------------|-------------|------------------------|-----------------------|----------------------|---------------------|-------------|------------------------|-----------------------|
| BEET GREENS | V-2 | 3438H-2 | N | 2.02 | NS | J | 1.60 | 21.00 | | | | 19.00 | 30.00 | | | | 26.50 | |
| BEET GREENS | V-7 | 3438H-7 | N | 0.00 | M | | 0.90 | 0.00 | M | | | 6.00 | 0.00 | M | | | 12.50 | |
| CARROTS | V-8 | 3438H-5 | N | 0.21 | UN | UJ | 0.55 | 2.10 | S | | | 1.50 | 5.90 | | | | 5.50 | |
| LETTUCE | V-13 | 3438H-11 | N | 2.82 | NS | J | 4.26 | 12.00 | S | | | 8.00 | 9.10 | | | | 10.00 | |
| LETTUCE | V-6 | 3438H-9 | N | 1.04 | NS | J | 5.10 | 11.00 | S | | | 10.00 | 12.00 | | | | 17.00 | |
| LETTUCE | V-6 | 3438H-10 | R | 2.85 | NS | J | 2.65 | 17.00 | T | R | | 14.50 | 18.00 | | | | 14.50 | |
| POTATOES | V-2 | 3438H-4 | N | 0.17 | UN | UJ | 0.90 | 0.83 | | | | 1.50 | 11.00 | | | | 15.50 | |
| POTATOES | V-7 | 3438H-8 | N | 0.19 | UN | UJ | 0.50 | 1.01 | | | | 0.66 | 14.00 | | | | 11.00 | |
| TOMATOES | V-11 | 3438H-1 | N | 0.19 | UN | UJ | 0.45 | 1.19 | S | | | 0.75 | 11.00 | | | | 11.50 | |
| TOMATOES | V-8 | 3438H-6 | N | 0.20 | UN | UJ | 0.20 | 0.59 | S | | | 0.47 | 7.90 | | | | 8.50 | |

Sample Type Codes: N = Natural Sample, R = Replicate Sample.

Lab and Reviewer Codes: N = Spike recovery not within control limit, S = Value determined by MSA, M = value missing, T = $R^2 < 0.995$ for MSA,
J = Value is an estimate, U = Actual value "less than" reported value, R = Data unusable.

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Table 2. Garden vegetable data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASARCO for the parameters Pb, Hg and Zn. The full data base is shown.

| Sample ID | Site Number | CLP Number | Sample Type | CLP | | | ASARCO | | | CLP | | | ASARCO | | | CLP | | | |
|-------------|-------------|------------|-------------|---------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|---------------|--------------|---------------|---------------|--------------|---------------|---------------|--------------|
| | | | | Pb (mg/kg) | Lab Codes | Rev. Codes | Pb (mg/kg) | Rev. Codes | Hg (mg/kg) | Lab Codes | Rev. Codes | Hg (mg/kg) | Lab Codes | Rev. Codes | Zn (mg/kg) | Lab Codes | Rev. Codes | Zn (mg/kg) | Lab Codes |
| BEET GREENS | V-2 | 3438H-2 | N | 19.00 | | | 15.80 | | 0.62 | N | J | 0.09 | | | 386.00 | | | 450.00 | |
| BEET GREENS | V-7 | 3438H-7 | N | 0.00 | M | | 11.70 | | 0.00 | M | | 0.04 | | | 0.00 | M | | 63.00 | |
| CARROTS | V-8 | 3438H-5 | N | 48.20 | * | J | 2.15 | | 0.79 | N | J | 0.02 | U | | 18.00 | | | 20.00 | |
| LETTUCE | V-13 | 3438H-11 | N | 6.00 | | | 4.30 | | 0.76 | N | J | 0.03 | | | 23.00 | | | 26.00 | |
| LETTUCE | V-6 | 3438H-9 | N | 10.00 | S | | 29.60 | | 0.23 | N | J | 0.20 | | | 60.00 | | | 89.50 | |
| LETTUCE | V-6 | 3438H-10 | R | 31.00 | | | 27.40 | | 1.20 | N | J | 0.22 | | | 75.00 | | | 86.50 | |
| POTATOES | V-2 | 3438H-4 | N | 40.20 | * | J | 8.05 | | 1.00 | N | J | 0.04 | | | 24.00 | | | 37.50 | |
| POTATOES | V-7 | 3438H-8 | N | 107.00 | | | 1.28 | | 1.00 | N | J | 0.03 | | | 19.00 | | | 26.00 | |
| TOMATOES | V-11 | 3438H-1 | N | 2.61 | | | 1.30 | | 0.50 | N | J | 0.02 | | | 25.00 | | | 27.50 | |
| TOMATOES | V-8 | 3438H-6 | N | 42.20 | * | J | 0.96 | | 1.10 | N | J | 0.02 | U | | 14.00 | | | 21.00 | |

Sample Type Codes: N = Natural Sample, R = Replicate Sample.

Lab and Reviewer Codes: N = Spike recovery not within control limit, S = Value determined by MSA, M = value missing, J = Value is an estimate,
U = Actual value "less than" reported value, * = Duplicate RPD not within control limit.

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Garden Vegetable Data
East Helena Smelter Site

Samples Used In The Paired T-Test and
Linear Regression Analysis

Table 3. Garden vegetable data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASARCO for the parameters As, Cd and Cu. Only samples use in the paired t-test analysis are shown.

| Sample ID | Site Number | CLP Number | Sample Type | CLP | | | ASARCO | | CLP | | | ASARCO | | CLP | | | ASARCO | |
|-------------|-------------|------------|-------------|---------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|---------------|--------------|---------------|--------------|---------------|---------------|--------------|
| | | | | As (mg/kg) | Lab Codes | Rev. Codes | As (mg/kg) | Rev. Codes | Cd (mg/kg) | Lab Codes | Rev. Codes | Cd (mg/kg) | Lab Codes | Cu (mg/kg) | Lab Codes | Rev. Codes | Cu (mg/kg) | Lab Codes |
| BEET GREENS | V-2 | 3438H-2 | N | 2.02 | NS | J | 1.60 | | 21.00 | | | 19.00 | | 30.00 | | | 26.50 | |
| BEET GREENS | V-7 | 3438H-7 | N | | | | | | | | | | | | | | | |
| CARROTS | V-8 | 3438H-5 | N | | | | | | 2.10 | S | | 1.50 | | 5.90 | | | 5.50 | |
| LETTUCE | V-13 | 3438H-11 | N | 2.82 | NS | J | 4.26 | | 12.00 | S | | 8.00 | | 9.10 | | | 10.00 | |
| LETTUCE | V-6 | 3438H-9 | N | 1.04 | NS | J | 5.10 | | 11.00 | S | | 10.00 | | 12.00 | | | 17.00 | |
| LETTUCE | V-6 | 3438H-10 | R | 2.85 | NS | J | 2.65 | | | | | | | 18.00 | | | 14.50 | |
| POTATOES | V-2 | 3438H-4 | N | | | | | | 0.83 | | | 1.50 | | 11.00 | | | 15.50 | |
| POTATOES | V-7 | 3438H-8 | N | | | | | | 1.01 | | | 0.66 | | 14.00 | | | 11.00 | |
| TOMATOES | V-11 | 3438H-1 | N | | | | | | 1.19 | S | | 0.75 | | 11.00 | | | 11.50 | |
| TOMATOES | V-8 | 3438H-6 | N | | | | | | 0.59 | S | | 0.47 | | 7.90 | | | 8.50 | |

Sample Type Codes: N = Natural Sample, R = Replicate Sample.

Lab and Reviewer Codes: N = Sike recovery not within control limit, S = Value determined by MSA, J = Value is an estimate, U = Actual value "less than" reported value.

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Table 4. Garden vegetable data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASARCO for the parameters Pb, Hg and Zn. Only samples used in the paired t-test analysis are shown.

| Sample ID | Site Number | CLP Number | Sample Type | CLP | | | ASARCO | | | CLP | | | ASARCO | | | CLP | | | |
|-------------|-------------|------------|-------------|---------------|--------------|---------------|---------------|---------------|---------------|--------------|---------------|---------------|--------------|---------------|---------------|--------------|---------------|---------------|--------------|
| | | | | Pb (mg/kg) | Lab Codes | Rev. Codes | Pb (mg/kg) | Rev. Codes | Hg (mg/kg) | Lab Codes | Rev. Codes | Hg (mg/kg) | Lab Codes | Rev. Codes | Zn (mg/kg) | Lab Codes | Rev. Codes | Zn (mg/kg) | Lab Codes |
| BEET GREENS | V-2 | 3438H-2 | N | 19.00 | | | 15.80 | | 0.62 | N | J | 0.09 | | | 386.00 | | | 450.00 | |
| BEET GREENS | V-7 | 3438H-7 | N | | | | | | | | | | | | | | | | |
| CARROTS | V-8 | 3438H-5 | N | 48.20 | * | J | 2.15 | | | | | | | | 18.00 | | | 20.00 | |
| LETTUCE | V-13 | 3438H-11 | N | 6.00 | | | 4.30 | | 0.76 | N | J | 0.03 | | | 23.00 | | | 26.00 | |
| LETTUCE | V-6 | 3438H-9 | N | 10.00 | S | | 29.60 | | 0.23 | N | J | 0.20 | | | 60.00 | | | 89.50 | |
| LETTUCE | V-6 | 3438H-10 | R | 31.00 | | | 27.40 | | 1.20 | N | J | 0.22 | | | 75.00 | | | 86.50 | |
| POTATOES | V-2 | 3438H-4 | N | 40.20 | * | J | 8.05 | | 1.00 | N | J | 0.04 | | | 24.00 | | | 37.50 | |
| POTATOES | V-7 | 3438H-8 | N | 107.00 | | | 1.28 | | 1.00 | N | J | 0.03 | | | 19.00 | | | 26.00 | |
| TOMATOES | V-11 | 3438H-1 | N | 2.61 | | | 1.30 | | 0.50 | N | J | 0.02 | | | 25.00 | | | 27.50 | |
| TOMATOES | V-8 | 3438H-6 | N | 42.20 | * | J | 0.96 | | | | | | | | 14.00 | | | 21.00 | |

Sample Type Codes: N = Natural Sample, R = Replicate Sample.

Lab and Reviewer Codes: N = Spike recovery not within control limit, S = Value determined by MSA, J = Value is an estimate, U = Actual value "less than" reported value, * = Duplicate RPD not within control limit.

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**Groundwater Data
East Helena Smelter Site**

Full Data Base

Table 1. Groundwater data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the parameters As, Cd and Cu. The full data set is shown.

| Site ID | Sample Number | CLP | | | ASRCO | | | CLP | | | ASRCO | | | CLP | | | ASRCO | | |
|--------------|---------------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|
| | | As (mg/l) | Lab Codes | Rev. | As (mg/l) | Lab Codes | Rev. | Cd (mg/l) | Lab Codes | Rev. | Cd (mg/l) | Lab Codes | Rev. | Cu (mg/l) | Lab Codes | Rev. | Cu (mg/l) | Lab Codes | Rev. |
| EH-50 | 8611-8 | .010 | U | U | .004 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0180 | | |
| EH-50(REP) | 8611-9 | .010 | U | U | .004 | U | U | .0050 | U | U | .0010 | | | .0040 | U | U | .0110 | | |
| EH-51 | 8610-150 | .900 | | | .970 | | | .0050 | U | U | .0010 | | | .0040 | D | | .0120 | | |
| EH-52 | 8611-15 | 1.150 | | | 1.010 | | | .0050 | U | U | .0010 | | | .0040 | U | U | .0080 | U | U |
| EH-53 | 8611-17 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | U | U |
| EH-53(REP) | 8611-18 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | | |
| EH-54 | 8611-32 | .011 | | | .013 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | U | U |
| EH-54(REP) | 8611-35 | .011 | | | .012 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | U | U |
| EH-58 | 8612-11 | .010 | U | U | .006 | U | U | .0050 | U | U | .0020 | | | .0061 | D | | .0100 | U | U |
| EH-100 | 8611-12 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | | | .0040 | U | U | .0100 | | |
| EH-100(REP) | 8611-13 | .010 | U | U | .006 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0100 | | |
| EH-101 | 8610-148 | .010 | U | U | .005 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0120 | | |
| EH-101(REP) | 8610-149 | .010 | U | U | .004 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0100 | | |
| EH-102 | 8611-14 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | U | U |
| WOJCIK | 8610-111 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | | | .0160 | D | | .0000 | M | |
| R LAMPING | 8610-141 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0220 | D | | .0000 | M | |
| DUEL | 8610-110 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0260 | | | .0000 | M | |
| AM CH 4 | 8610-106 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| NORDSTROM | 8610-142 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0140 | D | | .0000 | M | |
| ROMASKO | 8610-113 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0150 | D | | .0000 | M | |
| WESTON/RADLY | 8610-112 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | | | .0084 | D | | .0000 | M | |
| JNSN A2 | 8610-117 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0420 | | | .0000 | M | |
| ERNST | 8610-115 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| VETSCH | 8610-116 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| BERRY | 8610-114 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| HELPFERT | 8610-109 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0110 | D | | .0000 | M | |
| MANION | 8610-118 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| HOFF | 8610-119 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0770 | | | .0000 | M | |
| AM CH 2 | 8610-105 | .010 | U | U | .006 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| D.HULST | 8610-107 | .017 | | | .019 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| D.HULST(REP) | 8610-101 | .018 | | | .019 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |

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Table 1. Continued.

| Site ID | Sample Number | CLP | | | ASRCO | | | CLP | | | ASRCO | | | CLP | | | ASRCO | | |
|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|
| | | As (mg/l) | Lab Codes | Rev. Codes | As (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Cu (mg/l) | Lab Codes | Rev. Codes | Cu (mg/l) | Lab Codes | Rev. Codes |
| DH-1 | 8611-21 | .010 | U | U | .010 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| DH-2 | 8611-22 | .010 | U | U | .011 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| DH-3 | 8611-23 | .010 | U | U | .011 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| DH-4 | 8611-24 | 4.500 | | | 4.532 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| DH-5 | 8611-25 | .540 | | | .600 | | | .0050 | U | U | .0010 | | | .0140 | D | | .0000 | M | |
| DH-6 | 8611-26 | 4.600 | | | 5.300 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| DH-6(REP) | 8611-36 | 4.600 | | | 5.000 | | | .0050 | U | U | .0010 | U | U | .0059 | D | | .0000 | M | |
| DH-7 | 8611-27 | .010 | U | U | .008 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| DH-7(REP) | 8611-34 | .010 | U | U | .004 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | | |
| DH-8 | 8611-28 | .037 | | | .036 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| DH-9 | 8611-29 | 6.400 | | | 6.500 | | | .0050 | U | U | .0050 | | | .0092 | D | | .0000 | M | |
| DH-10 | 8611-30 | 4.300 | | | 4.375 | | | .0063 | | | .0010 | U | U | .0054 | D | | .0000 | M | |
| DH-11 | 8611-31 | .010 | U | U | .004 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| DH-12 | 8611-19 | 130.000 | | | 148.000 | | | .0300 | | | .0010 | U | U | .0080 | U | U | .0090 | | |
| DH-13 | 8611-10 | 130.000 | | | 160.000 | | | .0150 | | | .0010 | U | U | .0080 | U | U | .0090 | | |
| DH-14 | 8611-2 | .042 | | | .033 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | U | |
| DH-14(REP) | 8611-3 | .037 | | | .030 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | U | |
| DH-15 | 8611-5 | .010 | U | U | .004 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | U | |
| DH-15(REP) | 8611-6 | .010 | U | U | .004 | U | U | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | U | |
| DH-17 | 8612-2 | 78.000 | | | 87.500 | | | .0071 | | | .0010 | U | U | .0040 | U | U | .0100 | | |
| DH-17(REP) | 8612-3 | 78.000 | | | 87.500 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0100 | | |
| DH-18 | 8612-9 | .010 | U | U | .007 | | | .0050 | U | U | .0010 | | | .0040 | U | U | .0080 | U | |
| E HEL 1 | 8612-7 | .010 | U | U | .008 | | | .0050 | U | U | .0010 | | | .0040 | U | U | .0000 | M | |
| E HEL 2 | 8612-4 | .010 | U | U | .005 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| E HEL 2(REP) | 8612-5 | .010 | U | U | .004 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0000 | M | |
| EH-52 | 8611-45 | 1.300 | | | 1.400 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | U | |
| EH-52(REP) | 8611-33 | 1.300 | | | 1.400 | | | .0050 | U | U | .0010 | U | U | .0040 | U | U | .0080 | U | |
| ASRCO W | 8701-116 | .027 | | | .024 | | | .0050 | U | U | .0010 | U | U | .0170 | U | U | .0080 | U | |
| DH-13 | 8701-101 | 134.000 | | | 173.000 | | | .0054 | | | .0040 | | | .0250 | | | .0080 | | |
| DH-18 | 8701-105 | .009 | U | U | .006 | U | U | .0050 | U | U | .0010 | | | .0170 | U | U | .0080 | U | |
| EH-102 | 8701-111 | .009 | U | U | .006 | U | U | .0050 | U | U | .0010 | | | .0170 | U | U | .0080 | U | |
| EH-52 | 8701-110 | 1.640 | S | | 1.330 | | | .0050 | U | U | .0010 | | | .0210 | D | | .0080 | U | |

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Table 1. Continued.

| Site ID | Sample Number | CLP | | | ASRCO | | | CLP | | | ASRCO | | | CLP | | | ASRCO | | |
|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|
| | | As (mg/l) | Lab Codes | Rev. Codes | As (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Cu (mg/l) | Lab Codes | Rev. Codes | Cu (mg/l) | Lab Codes | Rev. Codes |
| EH-54 | 8701-114 | .009 | U | U | .015 | | | .0050 | U | U | .0010 | | | .0170 | U | U | .0080 | U | U |
| EH-58 | 8701-115 | .009 | U | U | .006 | U | U | .0050 | U | U | .0010 | | | .0170 | U | U | .0080 | U | U |
| KMMRMAN | 8701-118 | .009 | U | U | .006 | U | U | .0050 | U | U | .0010 | | | .0170 | U | U | .0080 | U | U |
| EH-102(REP) | 8701-139 | .009 | U | U | .006 | | | .0050 | U | U | .0010 | U | U | .0170 | U | U | .0080 | U | U |
| FMD SLG | 8704-20 | .020 | | | .028 | | | .0720 | | | .0600 | | | .2260 | | | .1930 | | |
| UNFMD SLG | 8704-24 | .513 | N | | .620 | | | .0063 | | | .0300 | | | .1190 | | | .1300 | | |
| EH-101 | 8704-30 | .009 | U | U | .006 | UA | U | .0044 | D | | .0010 | U | U | .0170 | U | U | .0080 | U | U |
| EH-51 | 8704-31 | .079 | N | | .107 | | | .0040 | U | U | .0010 | U | U | .0170 | U | U | .0080 | | |
| EH-54 | 8704-18 | .009 | U | U | .006 | UA | U | .0040 | U | U | .0010 | U | U | .0210 | D | | .0080 | U | U |
| EH-51(REP) | 8704-32 | .078 | N | | .092 | | | .0040 | U | U | .0010 | U | U | .0170 | D | | .0080 | U | U |
| MANION | 8704-150 | .009 | U | U | .006 | UN | U | .0040 | U | U | .0010 | | | .0170 | U | U | .0000 | M | |
| ERNST | 8704-47 | .009 | U | U | .006 | UN | U | .0040 | U | U | .0010 | | | .0170 | U | U | .0000 | M | |
| SIMAC | 8704-52 | .009 | UN | UJ | .008 | UN | U | .0040 | U | U | .0010 | | | .0380 | | | .0080 | | |
| ASRCO W | 8704-39 | .010 | D | J | .010 | O | | .0040 | U | U | .0010 | | | .0340 | | | .0080 | U | U |
| L.HULST(REP) | 8705-41 | .034 | N | J | .019 | 1 | | .0040 | U | U | .0010 | | | .0450 | | | .0080 | | |
| L.HULST | 8705-2 | .034 | N | J | .050 | 1 | | .0040 | U | U | .0010 | | | .0170 | U | U | .0100 | | |
| K.HULST | 8705-3 | .017 | N | U | .026 | A | | .0040 | U | U | .0010 | | | .0310 | | | .0080 | U | U |
| D.HULST | 8705-1 | .012 | N | J | .021 | | | .0040 | U | U | .0010 | U | U | .0370 | | | .0080 | U | U |
| E HEL 2 | 8704-58 | .009 | UN | UJ | .012 | UN | U | .0040 | U | U | .0010 | U | U | .0170 | U | U | .0000 | M | |
| STCLAIR(REP) | 8704-61 | .037 | N | J | .044 | | | .0040 | U | U | .0010 | U | U | .0260 | | | .0000 | M | |
| E HEL 1 | 8704-57 | .009 | U | UJ | .006 | UN | U | .0160 | | | .0010 | | | .0360 | | | .0000 | M | |
| STCLAIR | 8704-54 | .035 | N | J | .037 | | | .0040 | U | U | .0010 | U | U | .0440 | | | .0000 | M | |
| DH-20 | 8705-31 | .105 | N | J | .115 | A | | .0080 | | | .0010 | | | .0210 | D | | .0080 | U | U |
| DH-20(REP) | 8705-103 | .075 | | | .101 | | | .0040 | U | U | .0030 | | | .0170 | U | U | .0080 | U | U |
| EH-59(REP) | 8705-112 | .009 | U | U | .007 | UN | U | .0040 | U | U | .0060 | | | .0170 | U | U | .0080 | U | U |
| EH-59 | 8705-40 | .035 | | | .006 | U | U | .0040 | U | U | .0060 | | | .0170 | U | U | .0080 | U | U |
| DH-23 | 8705-33 | 8.173 | | | 7.810 | | | .2100 | | | .2200 | | | .0580 | | | .0230 | | |
| FMD SLG | 8705-47 | .052 | A | J | .030 | | | .0520 | | | .0510 | | | .1480 | | | .1280 | | |
| FMD SLG(REP) | 8705-50 | .032 | N | J | .038 | | | .0500 | | | .0510 | | | .1340 | | | .1250 | | |
| UMFMD SLG | 8705-48 | .083 | S | J | .353 | | | .0040 | U | U | .0030 | | | .0170 | U | U | .1280 | | |
| DH-3 | 8706-5 | .014 | A | J | .013 | | | .0040 | U | U | .0010 | U | U | .0200 | D | | .0080 | U | U |
| DH-15 | 8706-15 | .009 | U | U | .007 | | | .0040 | U | U | .0010 | U | U | .0300 | | | .0080 | U | U |

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Table 1. Continued.

| Site ID | Sample Number | CLP | | | ASRCO | | | CLP | | | ASRCO | | | CLP | | | ASRCO | | |
|--------------|---------------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|
| | | As (mg/l) | Lab Codes | Rev. | As (mg/l) | Lab Codes | Rev. | Cd (mg/l) | Lab Codes | Rev. | Cd (mg/l) | Lab Codes | Rev. | Cu (mg/l) | Lab Codes | Rev. | Cu (mg/l) | Lab Codes | Rev. |
| DH-15(REP) | 8706-36 | .009 | U | U | .007 | | | .0040 | U | U | .0010 | | | .0210 | D | | .0090 | | |
| DH-6 | 8706-8 | 5.170 | 0 | J | 4.650 | | | .0040 | U | U | .0010 | | | .0340 | | | .0160 | | |
| DH-12 | 8706-12 | 195.000 | 0 | J | 186.000 | | | .0070 | | | .0088 | | | .0250 | D | | .0100 | | |
| DH-17 | 8706-16 | 114.000 | 0 | J | 111.300 | | | .0040 | U | U | .0010 | | | .0250 | D | | .0080 | | |
| DH-26 | 8706-100 | 5.000 | G | R | 88.800 | | | 2.5200 | | | 2.3100 | | | .0410 | | | .0090 | | |
| DH-27 | 8706-22 | 52.400 | 0 | J | 49.500 | | | .0060 | | | .0020 | U | U | .0170 | U | U | .0120 | | |
| DH-21 | 8706-101 | 304.000 | 0 | J | 283.000 | | | .0040 | U | U | .0010 | | | .0870 | | | .0125 | | |
| DH-22 | 8706-19 | 8.580 | 0 | J | 9.100 | | | 4.9000 | | | 5.0000 | | | .0740 | | | .0410 | | |
| DH-19 | 8706-18 | 53.700 | 0 | J | 51.300 | | | 6.5800 | | | 6.8500 | | | .0440 | | | .0100 | | |
| DH-24 | 8706-20 | 5.000 | G | R | 80.500 | | | .3580 | | | .4200 | | | .0330 | | | .0200 | | |
| BLANK | 8706-29 | .022 | | | .008 | | | .0040 | U | U | .0010 | | | .0560 | | | .0080 | U | U |
| DH-24(REP) | 8706-39 | 81.800 | 0 | J | 79.400 | | | .3720 | | | .3650 | | | .0530 | | | .0180 | | |
| EH-53 | 8708-18 | .004 | U | U | .006 | U | U | .0015 | J | | .0010 | U | U | .0020 | D | | .0080 | U | U |
| BLANK | 8708-31 | .004 | U | U | .006 | | | .0011 | | | .0010 | U | U | .0020 | U | U | .0080 | U | U |
| EH-59 | 8708-21 | .004 | U | U | .006 | U | U | .0008 | J | | .0010 | | | .0020 | D | | .0080 | U | U |
| EH-52 | 8708-17 | 1.080 | | | 1.230 | | | .0007 | J | | .0010 | U | U | .0020 | D | | .0080 | U | U |
| EH-52(REP) | 8708-43 | 1.120 | | | 1.000 | | | .0009 | J | | .0010 | | | .0030 | O | | .0080 | U | U |
| BLANK | 8708-34 | .004 | U | U | .006 | | | .0002 | | | .0010 | U | U | .0040 | UN | UJ | .0080 | U | U |
| DH-14 | 8708-3 | .005 | D | | .006 | | | .0003 | | | .0010 | U | U | .0020 | UN | UJ | .0080 | U | U |
| DH-14(REP) | 8708-46 | .004 | D | | .016 | | | .0005 | | | .0010 | U | U | .0020 | UN | UJ | .0080 | U | U |
| DH-24 | 8708-12 | 43.200 | | | 75.000 | | | .5240 | | | .2720 | | | .0150 | N | J | .0150 | | |
| DH-19 | 8708-7 | 66.600 | | | 66.000 | | | 10.4000 | | | 7.5500 | | | .0020 | UN | UJ | .0080 | U | U |
| DH-26 | 8708-13 | 60.800 | | | 61.000 | | | 3.2000 | | | 1.8000 | | | .0020 | UN | UJ | .0080 | U | U |
| DH-26(REP) | 8708-49 | 61.000 | | | 58.800 | | | 2.5200 | | | 1.9500 | | | .0020 | UN | UJ | .0080 | U | U |
| BLANK | 8710-69 | .039 | * | R | .006 | U | U | .0010 | UN | U | .0010 | U | U | .0054 | D | | .0080 | U | U |
| AM CH 2 | 8710-51 | .002 | U | UJ | .006 | U | U | .0010 | UN | U | .0010 | | | .0067 | D | | .0080 | U | U |
| AM CH 2(REP) | 8710-72 | .002 | U | UJ | .006 | U | U | .0010 | UN | | .0010 | | | .0097 | D | | .0080 | U | U |
| BLANK | 8710-71 | .002 | U | U | .006 | U | U | .0002 | D | | .0010 | | | .0110 | D | | .0080 | U | U |
| WALTER | 8710-65 | .002 | U | U | .009 | | | .0001 | U | UJ | .0010 | | | .0100 | D | | .0140 | | |
| WALTER(REP) | 8710-74 | .003 | N | | .007 | | | .0001 | U | UJ | .0010 | | | .0200 | D | | .0140 | | |

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Table 1. Continued.

| Site ID | Sample Number | CLP | | | ASRCO | | | CLP | | | ASRCO | | | CLP | | | ASRCO | | |
|-------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|
| | | As (mg/l) | Lab Codes | Rev. Codes | As (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Cu (mg/l) | Lab Codes | Rev. Codes | Cu (mg/l) | Lab Codes | Rev. Codes |
| HELPERT | 8710-67 | .004 | N | | .009 | | | .0001 | U | UJ | .0010 | | | .0170 | D | | .0190 | | |
| STCLAIR | 8710-68 | .059 | N | | .063 | | | .0001 | U | UJ | .0010 | U | U | .0150 | D | | .0100 | | |
| EH-54 | 8711-204 | .006 | | | .006 | U | U | .0001 | U | U | .0010 | | | .0030 | U | U | .0080 | U | U |
| BLANK | 8711-209 | .002 | U | U | .054 | | | .0001 | U | U | .0010 | U | U | .0030 | D | | .0080 | U | U |
| EH-50 | 8711-200 | .002 | U | U | .006 | U | U | .0001 | D | | .0010 | | | .0042 | D | | .0100 | | |
| EH-50(REP) | 8711-213 | .002 | U | U | .016 | | | .0002 | D | | .0010 | | | .0033 | D | | .0100 | | |
| EH-100 | 8711-206 | .003 | D | | .020 | | | .0001 | D | | .0010 | | | .0044 | D | | .0130 | | |
| BLANK | 8711-211 | .002 | U | U | .014 | | | .0001 | U | U | .0010 | | | .0030 | U | U | .0080 | U | U |
| DH-1 | 8711-216 | .002 | U | U | .010 | | | .0001 | U | U | .0010 | | | .0070 | D | | .0090 | | |
| DH-4 | 8711-219 | 4.300 | | | 4.380 | | | .0310 | | | .0030 | | | .0037 | D | | .0080 | U | U |
| DH-10 | 8711-225 | 4.780 | | | 5.250 | | | .0350 | | | .0010 | | | .0044 | D | | .0080 | U | U |
| DH-7 | 8711-222 | .003 | D | J | .006 | U | U | .0003 | D | | .0010 | | | .0036 | D | | .0080 | U | U |
| BLANK | 8711-256 | .048 | J | | .054 | | | .0001 | U | U | .0010 | | | .0034 | D | | .0080 | U | U |
| DH-13(REP) | 8711-253 | 145.000 | J | 180.000 | | | | .4120 | | | .0030 | | | .0030 | U | U | .0080 | U | U |
| DH-23 | 8711-238 | 2.920 | J | 3.000 | | | | .5060 | | | .3500 | | | .0200 | D | | .0180 | | |
| BLANK | 8712-258 | .012 | | | .018 | | | .0008 | D | | .0030 | | | .0040 | D | | .0080 | U | U |
| EH-62 | 8712-247 | .006 | D | | .051 | | | .0078 | | J | .0140 | | | .0064 | D | | .0080 | U | |
| EH-60 | 8712-245 | 1.200 | | | 1.230 | | | .0100 | | J | .0100 | | | .0098 | D | | .0100 | | |
| EH-60(REP) | 8712-259 | 1.200 | | | 1.510 | | | .0100 | | J | .0060 | | | .0120 | D | | .0250 | | |
| EH-61 | 8712-246 | .009 | D | | .021 | | | .0037 | | | .0050 | | | .0083 | D | | .0080 | | |
| EH-57A | 8712-260 | .006 | D | | .103 | | | .0011 | D | | .0030 | | | .0051 | D | | .0080 | U | |
| EH-57A(REP) | 8712-261 | .002 | U | U | .013 | | | .0025 | | | .0040 | | | .0092 | D | | .0080 | U | U |
| DH-28 | 8712-300 | 270.000 | | 293.000 | | | | .0001 | U | U | .0030 | | | .0030 | U | U | .0080 | U | U |
| DH-28(REP) | 8712-301 | 270.000 | | 293.800 | | | | .0001 | U | U | .0030 | | | .0055 | D | | .0080 | U | U |
| DH-29 | 8712-303 | 18.400 | | 18.900 | | | | .0001 | U | U | .0010 | U | U | .0030 | U | U | .0080 | U | U |
| BLANK | 8712-302 | .005 | | | .010 | | | .0001 | D | | .0010 | U | U | .0030 | U | U | .0080 | U | U |

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Table 3. Groundwater data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the parameters Fe, Pb, Zn and SO₄. The full data base is shown.

| Site ID | Sample Number | CLP | | | | ASRCO | | | | CLP | | | | ASRCO | | | | CLP | | | | ASRCO | | | | CLP | | | |
|--------------|---------------|-------|-----|------|--------------|-------|-------|-------|--------------|-------|-------|------|--------------|-------|-----|------|--------------|-----------------|-------|-------|--------------|-----------------|-----|------|--------------|-----|--|--|--|
| | | Fe | Lab | Rev. | (mg/l) Codes | Fe | Lab | Rev. | (mg/l) Codes | Pb | Lab | Rev. | (mg/l) Codes | Zn | Lab | Rev. | (mg/l) Codes | SO ₄ | Lab | Rev. | (mg/l) Codes | SO ₄ | Lab | Rev. | (mg/l) Codes | | | | |
| EH-50 | 8611-8 | .025 | U | U | .040 | | .0050 | U | U | .0050 | U | U | .009 | D | | .014 | | 723.0 | | 683.0 | | | | | | | | | |
| EH-50(REP) | 8611-9 | .025 | U | U | .028 | | .0050 | U | U | .0050 | U | U | .011 | D | | .015 | | .0 | M | .0 | M | | | | | | | | |
| EH-51 | 8610-150 | .042 | D | | .058 | | .0050 | U | U | .0050 | U | U | .046 | | | .052 | | 577.0 | | 546.0 | | | | | | | | | |
| EH-52 | 8611-15 | .025 | U | U | .062 | | .0050 | U | U | .0050 | U | U | .021 | | | .025 | | 264.0 | | 250.0 | | | | | | | | | |
| EH-53 | 8611-17 | .025 | U | U | .038 | | .0050 | U | U | .0050 | U | U | .020 | | | .024 | | 509.0 | | 488.0 | | | | | | | | | |
| EH-53(REP) | 8611-18 | .025 | U | U | .038 | | .0050 | U | U | .0050 | U | U | .019 | D | | .022 | | .0 | M | .0 | M | | | | | | | | |
| EH-54 | 8611-32 | .025 | U | U | .020 | U | U | .0050 | U | U | .0050 | U | U | .002 | U | U | .008 | U | U | .61.0 | | 52.0 | | | | | | | |
| EH-54(REP) | 8611-35 | .025 | U | U | .020 | U | U | .0050 | U | U | .0050 | U | U | .003 | D | | .008 | U | U | .0 | M | .0 | M | | | | | | |
| EH-58 | 8612-11 | .025 | U | U | .033 | | .0050 | U | U | .0050 | U | U | .014 | D | | .013 | | 177.0 | | 125.0 | | | | | | | | | |
| EH-100 | 8611-12 | 1.530 | | | 1.512 | | .0500 | U | U | .0050 | U | U | .230 | | | .050 | | 905.0 | | 878.0 | | | | | | | | | |
| EH-100(REP) | 8611-13 | 1.500 | | | 1.550 | | .0500 | U | U | .0050 | U | U | .043 | | | .069 | | .0 | M | .0 | M | | | | | | | | |
| EH-101 | 8610-148 | .025 | U | U | .057 | | .0050 | U | U | .0050 | U | U | .012 | D | | .023 | | 550.0 | | 516.0 | | | | | | | | | |
| EH-101(REP) | 8610-149 | .025 | U | U | .030 | | .0050 | U | U | .0050 | U | U | .011 | D | | .018 | | .0 | M | .0 | M | | | | | | | | |
| EH-102 | 8611-14 | .025 | U | U | .025 | | .0050 | U | U | .0050 | U | U | .002 | U | U | .009 | | 145.0 | | 268.0 | | | | | | | | | |
| WOJCIK | 8610-111 | .025 | U | U | .050 | | .0050 | U | U | .0050 | U | U | .006 | D | | .012 | | 58.0 | | 60.0 | | | | | | | | | |
| R LAMPING | 8610-141 | .025 | U | U | .025 | | .0050 | U | U | .0050 | U | U | .011 | D | | .016 | | 140.0 | | 135.0 | | | | | | | | | |
| DUEL | 8610-110 | .025 | U | U | .025 | | .0050 | U | U | .0050 | U | U | .005 | D | | .008 | U | U | .51.0 | | 56.0 | | | | | | | | |
| AM CH 4 | 8610-106 | .025 | U | U | .038 | | .0050 | U | U | .0050 | U | U | .002 | U | U | .008 | U | U | .21.0 | | 25.0 | | | | | | | | |
| NORDSTROM | 8610-142 | .025 | U | U | .050 | | .0050 | U | U | .0050 | U | U | .020 | | | .022 | | 89.0 | | 103.0 | | | | | | | | | |
| ROMASKO | 8610-113 | .137 | | | .138 | | .0500 | U | U | .0050 | U | U | .005 | D | | .008 | | 309.0 | | 384.0 | | | | | | | | | |
| WESTON/RADLY | 8610-112 | .025 | U | U | .038 | | .0050 | U | U | .0050 | U | U | .004 | D | | .010 | | 83.0 | | 101.0 | | | | | | | | | |
| JNSN A2 | 8610-117 | .025 | U | U | .025 | | .0050 | U | U | .0050 | U | U | .003 | D | | .009 | | 142.0 | | 141.0 | | | | | | | | | |
| ERNST | 8610-115 | 4.460 | | | 4.225 | | .0500 | U | U | .0050 | U | U | .006 | D | | .016 | | 499.0 | | 488.0 | | | | | | | | | |
| VETSCH | 8610-116 | 1.430 | | | 2.225 | | .0500 | U | U | .0050 | U | U | .004 | D | | .009 | | 436.0 | | 420.0 | | | | | | | | | |
| BERRY | 8610-114 | .931 | | | .912 | | .0500 | U | U | .0050 | U | U | .014 | D | | .021 | | 491.0 | | 476.0 | | | | | | | | | |
| HELFERT | 8610-109 | .025 | U | U | .020 | U | U | .0050 | U | U | .0050 | U | U | .004 | D | | .009 | | 97.0 | | 95.0 | | | | | | | | |
| MANION | 8610-118 | 3.390 | | | 2.075 | | .0500 | U | U | .0050 | U | U | .012 | D | | .015 | | 801.0 | | 500.0 | | | | | | | | | |
| HOFF | 8610-119 | .025 | U | U | .025 | | .0500 | U | U | .0050 | U | U | .020 | D | | .016 | | 453.0 | | 420.0 | | | | | | | | | |
| AM CH 2 | 8610-105 | .546 | | | .550 | | .0050 | U | U | .0050 | U | U | .051 | | | .054 | | 61.0 | | 29.0 | | | | | | | | | |
| D.HULST | 8610-107 | .025 | U | U | .025 | | .0050 | U | U | .0050 | U | U | .002 | U | U | .008 | U | U | 115.0 | | 101.0 | | | | | | | | |

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Table 3. Continued.

| Site ID | Sample Number | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | |
|--------------|---------------|-----------|-----------|----------|-----------|-----------|------------|-----------|-----------|----------|-----------------|-----------|------------|-----------|-----------|----------|-----------------|-----------|----------|------------------------------|-----------|------------------------------|-----------|--|--|
| | | Fe (mg/l) | Lab Codes | CLP Rev. | Fe (mg/l) | Lab Codes | ASR00 Rev. | Pb (mg/l) | Lab Codes | CLP Rev. | ASR00 Pb (mg/l) | Lab Codes | ASR00 Rev. | Zn (mg/l) | Lab Codes | CLP Rev. | ASR00 Zn (mg/l) | Lab Codes | CLP Rev. | ASR00 SO ₄ (mg/l) | Lab Codes | ASR00 SO ₄ (mg/l) | Lab Codes | | |
| D.HULST(REP) | 8610-101 | .025 | U | U | .020 | U | U | .0050 | U | U | .0050 | U | U | .002 | U | U | .008 | U | U | 101.0 | | .0 | M | | |
| DH-1 | 8611-21 | .025 | U | U | .050 | | | .0500 | U | U | .0050 | U | U | .002 | U | U | .008 | U | U | .0 | M | 720.0 | | | |
| DH-2 | 8611-22 | .025 | U | U | .038 | | | .0050 | U | U | .0050 | U | U | .002 | U | U | .008 | U | U | .0 | M | 53.0 | | | |
| DH-3 | 8611-23 | .025 | U | U | .038 | | | .0050 | U | U | .0050 | U | U | .002 | U | U | .008 | U | U | .0 | M | 67.0 | | | |
| DH-4 | 8611-24 | 15.800 | | | 15.700 | | | .0050 | U | U | .0050 | U | U | .006 | D | | .008 | U | U | .0 | M | 130.0 | | | |
| DH-5 | 8611-25 | .025 | U | U | .020 | U | U | .0062 | | | .0070 | | | .868 | | | .790 | | | 40.0 | | 37.0 | | | |
| DH-6 | 8611-26 | .025 | U | U | .023 | | | .0500 | U | U | .0050 | U | U | .002 | D | | .013 | | | 614.0 | | 630.0 | | | |
| DH-6(REP) | 8611-36 | .025 | U | U | .020 | | | .0500 | U | U | .0050 | U | U | .002 | U | U | .009 | | | .0 | M | .0 | M | | |
| DH-7 | 8611-27 | .025 | U | U | .038 | | | .0050 | U | U | .0050 | U | U | .002 | D | | .010 | | | .0 | M | 56.0 | | | |
| DH-7(REP) | 8611-34 | .025 | U | U | .025 | | | .0050 | U | U | .0050 | U | U | .003 | D | | .008 | U | U | .0 | M | .0 | M | | |
| DH-8 | 8611-28 | .025 | U | U | .035 | | | .0500 | U | U | .0050 | U | U | .006 | D | | .015 | | | 1350.0 | | 1340.0 | | | |
| DH-9 | 8611-29 | .025 | U | U | .020 | U | U | .0050 | U | U | .0050 | U | U | .350 | | | .350 | | | 553.0 | | 520.0 | | | |
| DH-10 | 8611-30 | .412 | | | .338 | | | .0050 | U | U | .0050 | U | U | .082 | | | .070 | | | .0 | M | 560.0 | | | |
| DH-11 | 8611-31 | .025 | U | U | .025 | | | .0050 | U | U | .0050 | U | U | .002 | U | U | .008 | U | U | .0 | M | 54.0 | | | |
| DH-12 | 8611-19 | 1.780 | | | 19.000 | | | .0500 | | | .0050 | U | U | 3.450 | | | 3.300 | | | 1730.0 | | 1697.0 | | | |
| DH-13 | 8611-10 | 47.200 | | | 45.600 | | | .0500 | U | U | .0050 | U | U | 27.800 | | | 27.500 | | | 1530.0 | | 1476.0 | | | |
| DH-14 | 8611-2 | 4.380 | | | 3.900 | | | .0050 | U | U | .0050 | U | U | .156 | | | .099 | | | 86.0 | | 14.0 | | | |
| DH-14(REP) | 8611-3 | 3.760 | J | | 4.100 | | | .0050 | U | U | .0050 | U | U | .094 | | | .100 | | | .0 | M | .0 | M | | |
| DH-15 | 8611-5 | .286 | J | | .260 | | | .0050 | U | U | .0050 | U | U | .022 | | | .021 | | | 425.0 | | 406.0 | | | |
| DH-15(REP) | 8611-6 | .289 | J | | .260 | | | .0050 | U | U | .0050 | U | U | .018 | D | | .020 | | | .0 | M | .0 | M | | |
| DH-17 | 8612-2 | 42.400 | | | 41.000 | | | .0500 | U | U | .0050 | U | U | 3.900 | | | 4.000 | | | 1510.0 | | 1520.0 | | | |
| DH-17(REP) | 8612-3 | 41.800 | | | 41.000 | | | .0500 | U | U | .0050 | U | U | 3.900 | | | 4.000 | | | .0 | M | .0 | M | | |
| DH-18 | 8612-9 | .025 | U | U | .025 | | | .0050 | U | U | .0050 | U | U | .241 | | | .126 | | | 61.0 | | 36.0 | | | |
| E HEL 1 | 8612-7 | .122 | | | .104 | | | .0050 | U | U | .0050 | U | U | .007 | D | | .009 | | | 63.0 | | 60.0 | | | |
| E HEL 2 | 8612-4 | .025 | U | U | .020 | U | U | .0050 | U | U | .0050 | U | U | .003 | D | | .008 | | | 62.0 | | 53.0 | | | |
| E HEL 2(REP) | 8612-5 | .025 | U | U | .031 | | | .0050 | U | U | .0050 | U | U | .004 | D | | .008 | U | U | .0 | M | .0 | M | | |
| EH-52 | 8611-45 | .025 | U | U | .025 | | | .0050 | U | U | .0050 | U | U | .016 | D | | .018 | | | .0 | M | 210.0 | | | |
| EN-52(REP) | 8611-33 | .025 | U | U | .020 | | | .0050 | U | U | .0050 | U | U | .014 | D | | .014 | | | .0 | M | .0 | M | | |
| ASR00 W | 8701-116 | .894 | | | .890 | | | .0030 | UN | W | .0050 | U | U | .069 | * | J | .018 | | | 12.8 | | 13.0 | | | |
| DH-13 | 8701-101 | 23.900 | | | 24.000 | | | .0300 | U | U | .0050 | UN | U | 13.600 | | | 12.800 | | | 1831.0 | | 1950.0 | | | |
| DH-18 | 8701-105 | .079 | D | | .020 | U | U | .0030 | U | U | .0050 | UN | U | .022 | G | | .008 | U* | | 32.9 | | 35.0 | | | |

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Table 3. Continued.

| Site ID | Sample Number | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | |
|--------------|---------------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|---------------------------|--------------|---------------------------|--------------|--|--|
| | | Fe (mg/l) | Lab Codes | Rev. | Fe (mg/l) | Lab Codes | Rev. | Pb (mg/l) | Lab Codes | Rev. | Pb (mg/l) | Lab Codes | Rev. | Zn (mg/l) | Lab Codes | Rev. | Zn (mg/l) | Lab Codes | Rev. | SO ₄ (mg/l) | Lab Codes | SO ₄ (mg/l) | Lab Codes | | |
| EH-102 | 8701-111 | .039 | U | W | .020 | UN | U | .0030 | D | J | .0050 | U | U | .041 | G | J | .008 | U* | | 123.0 | | 140.0 | | | |
| EH-52 | 8701-110 | .570 | N | J | .044 | | | .0039 | D | J | .0050 | 2 | | .130 | * | J | .010 | | | 93.2 | | 91.0 | | | |
| EH-54 | 8701-114 | .114 | N | J | .020 | U | U | .0122 | N | J | .0050 | U | U | .153 | * | J | .008 | U | U | 55.8 | | 58.0 | | | |
| EH-58 | 8701-115 | .066 | N | J | .020 | U | U | .0037 | D | J | .0050 | 0 | | .098 | G | J | .008 | * | | 94.9 | | 95.0 | | | |
| KMNRMAN | 8701-118 | .254 | N | J | .225 | | | .0037 | D | J | .0050 | 0 | | .096 | G | J | .031 | * | | 132.0 | | 130.0 | | | |
| EH-102(REP) | 8701-139 | .162 | N | J | .020 | U | U | .0030 | D | J | .0050 | 0 | | .234 | G | J | .008 | U* | | .0 | M | .0 | M | | |
| FMD SLG | 8704-20 | .100 | U | U | .020 | U | U | .0334 | | | .0300 | | | 4.450 | | | 3.700 | | | 1240.0 | | 1425.0 | | | |
| UNFMD SLG | 8704-24 | .100 | U | U | .150 | | | .1230 | N | J | .0980 | | | .090 | | | .100 | | | 2480.0 | | 9200.0 | | | |
| EH-101 | 8704-30 | .100 | U | U | .020 | U | U | .0058 | | | .0050 | U | U | .020 | U | U | .008 | U | U | 476.0 | | 420.0 | | | |
| EH-51 | 8704-31 | .100 | U | U | .020 | U | U | .0030 | U | U | .0050 | U | U | .020 | U | U | .008 | U | U | 417.0 | | 460.0 | | | |
| EH-54 | 8704-18 | .100 | U | U | .020 | U | U | .0030 | U | U | .0050 | U | U | .020 | U | U | .008 | U | U | 48.0 | | 61.0 | | | |
| EH-51(REP) | 8704-32 | .100 | U | U | .027 | | | .0058 | | | .0050 | U | U | .020 | | | .013 | | | .0 | M | .0 | M | | |
| MANION | 8704-150 | 1.600 | | | 1.450 | | | .0030 | U | U | .0050 | U | U | .032 | | | .040 | | | 910.0 | | 980.0 | | | |
| ERNST | 8704-47 | 1.450 | | | 1.250 | | | .0030 | U | U | .0050 | U | U | .020 | U | U | .008 | | | 480.0 | | 550.0 | | | |
| SIMAC | 8704-52 | .100 | U | U | .020 | | | .0030 | U | U | .0050 | U | U | .089 | | | .081 | | | 76.1 | | 90.0 | | | |
| ASR00 W | 8704-39 | 1.450 | | | 1.290 | | | .0030 | U | U | .0050 | U | U | .020 | U | U | .008 | U | U | 22.7 | | 21.0 | | | |
| L.HULST(REP) | 8705-41 | .100 | U | U | .026 | | | .0030 | U | U | .0050 | U | U | .020 | U | U | .020 | | | .0 | M | .0 | M | | |
| L.HULST | 8705-2 | .100 | U | U | .046 | | | .0032 | U | U | .0070 | | | .020 | U | U | .040 | | | 47.7 | | 57.0 | | | |
| K.HULST | 8705-3 | .100 | U | U | .028 | | | .0030 | U | U | .0050 | U | U | .020 | U | U | .016 | | | 95.0 | | 104.0 | | | |
| D.HULST | 8705-1 | .100 | U | U | .029 | | | .0030 | U | U | .0050 | U | U | .020 | U | U | .008 | U | U | 72.0 | | 70.0 | | | |
| E HEL 2 | 8704-58 | .100 | U | U | .039 | | | .0030 | U | U | .0050 | U | U | .020 | U | U | .008 | U | U | 42.8 | | 53.0 | | | |
| STCLAIR(REP) | 8704-61 | .100 | U | U | .045 | | | .0030 | U | U | .0050 | U | U | .047 | | | .040 | | | .0 | M | .0 | M | | |
| E HEL 1 | 8704-57 | .100 | U | U | .021 | | | .0030 | U | U | .0050 | U | U | .096 | | | .008 | U | U | 55.1 | | 64.0 | | | |
| STCLAIR | 8704-54 | .100 | U | U | .031 | | | .0030 | U | U | .0050 | U | U | .048 | | | .038 | | | 130.0 | | 136.0 | | | |
| DH-20 | 8705-31 | 2.610 | | | 3.380 | | | .0270 | F | | .0050 | U | U | .026 | | | .008 | U | U | 135.0 | | 7.0 | | | |
| DH-20(REP) | 8705-103 | 3.010 | | | 3.630 | | | .0300 | F | | .0050 | U | U | .020 | U | U | .008 | U | U | .0 | M | .0 | M | | |
| EH-59(REP) | 8705-112 | .100 | U | U | .020 | U | U | .0310 | S | J | .0090 | | | .020 | U | U | .018 | | | .0 | M | .0 | M | | |
| EH-59 | 8705-40 | .100 | U | U | .020 | | | .0036 | D | | .0050 | U | U | .020 | U | U | .019 | | | 110.0 | | 106.0 | | | |
| DH-23 | 8705-33 | .100 | U | U | .039 | | | .0820 | S | J | .0475 | | | 3.110 | | | 3.000 | | | 5.3 | | 610.0 | | | |
| FMD SLG | 8705-47 | .100 | U | U | .045 | | | .0323 | N | J | .0200 | | | 2.860 | | | 2.890 | | | 1304.0 | | 1338.0 | | | |
| FMD SLG(REP) | 8705-50 | .100 | U | U | .044 | | | .0432 | N | J | .0190 | | | 2.820 | | | 2.830 | | | .0 | M | .0 | M | | |

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Table 3. Continued.

| Site ID | Sample Number | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | |
|--------------|---------------|-----------|-----------|----------|-----------|-----------|------------|-----------|-----------|----------|-----------|-----------|------------|-----------|-----------|----------|-----------|-----------|------------|------------------------|-----------|----------|--------------|------------------------|-----------|
| | | Fe (mg/l) | Lab Codes | CLP Rev. | Fe (mg/l) | Lab Codes | ASR00 Rev. | Pb (mg/l) | Lab Codes | CLP Rev. | Fe (mg/l) | Lab Codes | ASR00 Rev. | Zn (mg/l) | Lab Codes | CLP Rev. | Fe (mg/l) | Lab Codes | ASR00 Rev. | SO ₄ (mg/l) | Lab Codes | CLP Rev. | ASR00 (mg/l) | SO ₄ (mg/l) | Lab Codes |
| UMMD SLG | 8705-48 | .100 | U | U | .225 | | | .0300 | U | UJ | .0505 | | | .020 | U | U | .048 | | | 2463.0 | | | 1200.0 | | |
| DH-3 | 8706-5 | .100 | U | U | .020 | U | U | .0030 | U | UJ | .0050 | U | U | .020 | U | U | .009 | | | 57.6 | | | 69.0 | | |
| DH-15 | 8706-15 | .826 | | | .700 | | | .0030 | U | UJ | .0050 | U | U | .022 | | | .008 | | | 393.8 | | | 430.0 | | |
| DH-15(REP) | 8706-36 | .882 | | | .725 | | | .0030 | U | UJ | .0070 | | | .023 | | | .008 | U | U | .0 | M | | .0 | M | |
| DH-6 | 8706-8 | .100 | U | U | .020 | U | U | .0030 | U | UJ | .0050 | U | U | .026 | | | .008 | | | 504.5 | | | 625.0 | | |
| DH-12 | 8706-12 | .792 | | | .480 | | | .0300 | U | UJ | .0050 | U | U | 1.410 | | | 1.250 | | | 2394.5 | | | 2250.0 | | |
| DH-17 | 8706-16 | 13.500 | | | 14.100 | | | .0300 | U | UJ | .0050 | U | U | 5.660 | | | 5.310 | | | 1523.8 | | | 1550.0 | | |
| DH-26 | 8706-100 | 56.100 | | | 53.000 | | | .0500 | A | J | .0440 | | | 35.700 | | | 35.300 | | | 1264.1 | | | 1338.0 | | |
| DH-27 | 8706-22 | 51.900 | | | 43.300 | | | .0300 | U | UJ | .0050 | U | U | 8.330 | | | 7.180 | | | 1798.3 | | | 1788.0 | | |
| DH-21 | 8706-101 | .478 | | | .373 | | | .0300 | UN | UJ | .0275 | | | .082 | | | .010 | | | 2373.1 | | | 2188.0 | | |
| DH-22 | 8706-19 | .285 | | | .144 | | | .0030 | U | U | .0050 | U | U | 3.314 | | | 3.160 | | | 617.0 | | | 725.0 | | |
| DH-19 | 8706-18 | 45.400 | | | 46.200 | | | .0920 | | | .0900 | | | 32.820 | | | 33.000 | | | 887.0 | | | 1025.0 | | |
| DH-24 | 8706-20 | 63.500 | | | 52.500 | | | .0300 | UE | U | .0050 | U | U | 31.370 | | | 32.000 | | | 1530.0 | | | 1550.0 | | |
| BLANK | 8706-29 | .100 | U | U | .020 | U | U | .0030 | U | U | .0050 | U | U | .108 | | | .008 | U | U | .0 | M | | .0 | M | |
| DH-24(REP) | 8706-39 | 64.600 | | | 52.000 | | | .0300 | U | U | .0050 | U | U | 31.960 | | | 32.000 | | | .0 | M | | .0 | M | |
| EH-53 | 8708-18 | .010 | D | | .020 | U | U | .0020 | U | U | .0060 | | | .003 | U | U | .009 | | | 940.0 | H | | 960.0 | | |
| BLANK | 8708-31 | .011 | D | | .024 | | | .0020 | U | U | .0050 | U | U | .002 | U | U | .010 | | | .0 | M | | .0 | M | |
| EH-59 | 8708-21 | .015 | D | | .020 | U | U | .0020 | U | U | .0050 | U | U | .002 | U | U | .008 | U | U | 62.0 | H | | 66.0 | | |
| EH-52 | 8708-17 | .019 | D | | .020 | U | U | .0020 | U | U | .0050 | U | U | .012 | D | | .012 | | | 190.0 | H | | 187.0 | | |
| EH-52(REP) | 8708-43 | .017 | D | | .023 | | | .0020 | U | U | .0050 | U | U | .012 | | | .015 | | | .0 | M | | .0 | M | |
| BLANK | 8708-34 | .013 | | | .025 | | | .0020 | U | U | .0050 | U | U | .005 | | | .008 | | | .0 | M | | .0 | M | |
| DH-14 | 8708-3 | .271 | | | .273 | | | .0020 | U | U | .0060 | | | .007 | J | | .010 | | | 16.0 | H | | 10.0 | | |
| DH-14(REP) | 8708-46 | .299 | | | .320 | | | .0020 | U | U | .0050 | | | .011 | D | J | .010 | | | .0 | M | | .0 | M | |
| DH-24 | 8708-12 | 67.300 | | | 57.600 | | | .0020 | U | U | .0050 | U | U | 32.000 | | | 35.800 | | | 1600.0 | H | | 1640.0 | | |
| DH-19 | 8708-7 | 45.400 | | | 45.300 | | | .0890 | | | .0940 | | | 32.500 | | | 32.500 | | | 920.0 | H | | 930.0 | | |
| DH-26 | 8708-13 | 64.400 | | | 49.800 | | | .0220 | | | .0170 | | | 32.300 | | | 33.800 | | | 1500.0 | H | | 1480.0 | | |
| DH-26(REP) | 8708-49 | 62.800 | | | 57.000 | | | .0270 | | | .0175 | | | 31.200 | | | 31.500 | | | .0 | M | | .0 | M | |
| BLANK | 8710-69 | .012 | D | | .024 | | | .0030 | D | | .0050 | U | U | .007 | D | J | .008 | U | U | .0 | M | | .0 | M | |
| AM CH 2 | 8710-51 | .781 | | | .988 | | | .0040 | D | | .0050 | U | U | .071 | | | .069 | | | .0 | M | | .0 | M | 25.0 |
| AM CH 2(REP) | 8710-72 | .503 | | | .735 | | | .0030 | D | | .0050 | U | U | .067 | | | .070 | | | .0 | M | | .0 | M | |
| BLANK | 8710-71 | .019 | D | | .020 | U | U | .0100 | | | .0050 | U | U | .008 | D | | .018 | | | .0 | M | | .0 | M | |

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Table 3. Continued.

| Site ID | Sample Number | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | |
|-------------|---------------|--------|-----|------|--------|-----|------|-------|-----|------|-------|-----|------|-------|-----|------|-------|-----|------|-----------------|-----|-----------------|-------|--|--|
| | | Fe | Lab | Rev. | Fe | Lab | Rev. | Pb | Lab | Rev. | Pb | Lab | Rev. | Zn | Lab | Rev. | Zn | Lab | Rev. | SO ₄ | Lab | SO ₄ | Lab | | |
| WALTER | 8710-65 | .028 | D | | .044 | | | .0050 | J | | .0050 | U | U | .119 | | | .095 | | | 41.0 | | 49.0 | | | |
| WALTER(REP) | 8710-74 | .027 | D | | .035 | | | .0040 | J | | .0050 | U | U | .168 | | | .075 | | | .0 | M | .0 | M | | |
| HELFERT | 8710-67 | .023 | D | | .028 | | | .0030 | J | | .0050 | U | U | .012 | D | J | .013 | | | 75.0 | | 78.0 | | | |
| STCLAIR | 8710-68 | .041 | D | | .066 | | | .0030 | J | | .0050 | U | U | .055 | | | .049 | | | 110.0 | | 114.0 | | | |
| EH-54 | 8711-204 | .007 | D | | .020 | U | U | .0030 | D | | .0050 | U | U | .006 | D | J | .008 | | | 40.0 | H | 45.0 | | | |
| BLANK | 8711-209 | .008 | D | | .020 | U | U | .0030 | U | U | .0050 | U | U | .007 | D | | .008 | U | U | .0 | M | .0 | M | | |
| EH-50 | 8711-200 | .005 | D | | .036 | | | .0030 | U | U | .0125 | U | U | .004 | D | J | .008 | U | U | 980.0 | H | 970.0 | | | |
| EH-50(REP) | 8711-213 | .004 | U | U | .035 | | | .0030 | U | U | .0100 | | | .004 | D | J | .008 | U | U | .0 | M | .0 | 950.0 | | |
| EH-100 | 8711-206 | .290 | | | .183 | | | .0030 | D | | .0125 | | | .573 | | | .078 | | | 1000.0 | H | 1030.0 | | | |
| BLANK | 8711-211 | .004 | U | U | .020 | U | U | .0030 | U | U | .0050 | U | U | .005 | D | | .009 | | | .0 | M | .0 | M | | |
| DH-1 | 8711-216 | .008 | D | | .036 | | | .0030 | U | U | .0050 | | | .008 | D | J | .008 | U | U | 850.0 | H | 860.0 | | | |
| DH-4 | 8711-219 | 13.000 | | | 11.500 | | | .0030 | U | U | .0050 | U | U | .010 | D | J | .008 | U | U | 60.0 | H | 73.0 | | | |
| DH-10 | 8711-225 | .007 | D | | .069 | | | .0030 | U | U | .0050 | U | U | .026 | | | .024 | | | 86.0 | H | 95.0 | | | |
| DH-7 | 8711-222 | .008 | D | | .020 | U | U | .0060 | | | .0050 | U | U | .019 | D | | .010 | | | 44.0 | | 46.0 | | | |
| BLANK | 8711-256 | .009 | D | | .025 | | | .0040 | D | | .0050 | U | U | .009 | D | | .009 | | | .0 | M | .0 | M | | |
| DH-13(REP) | 8711-253 | 12.800 | | | 8.660 | | | .0040 | O | | .0100 | U | U | 7.320 | | | 6.290 | | | .0 | M | .0 | M | | |
| DH-23 | 8711-238 | .151 | | | .099 | | | .0650 | | | .0350 | | | 7.040 | | | 6.200 | | | 770.0 | | 750.0 | | | |
| BLANK | 8712-258 | .004 | U | U | .020 | U | U | .0020 | U | U | .0050 | U | U | .008 | | | .015 | | | .0 | M | .0 | M | | |
| EH-62 | 8712-247 | .005 | D | | .036 | | | .0020 | U | U | .0050 | U | U | .019 | D | | .020 | | | 320.0 | | 340.0 | | | |
| EH-60 | 8712-245 | .006 | D | | .041 | | | .0020 | U | U | .0050 | U | U | .085 | | | .115 | | | 730.0 | | 750.0 | | | |
| EH-60(REP) | 8712-259 | .006 | D | | .033 | | | .0020 | U | U | .0050 | U | U | .034 | | | .043 | | | .0 | M | .0 | M | | |
| EH-61 | 8712-246 | .610 | | | .043 | | | .0020 | U | U | .0050 | U | U | .026 | | | .030 | | | 570.0 | | 560.0 | | | |
| EH-57A | 8712-260 | .004 | U | U | .033 | | | .0020 | U | U | .0100 | | | .009 | D | | .008 | U | | 58.0 | | 65.0 | | | |
| EH-57A(REP) | 8712-261 | .004 | D | | .021 | | | .0020 | U | U | .0125 | U | U | .009 | D | | .024 | | | .0 | M | .0 | M | | |
| DH-28 | 8712-300 | .388 | J | | .450 | | | .0150 | U | U | .0230 | | | .005 | D | | .008 | | | 3260.0 | | 4150.0 | | | |
| DH-28(REP) | 8712-301 | .489 | J | | .500 | | | .0150 | U | U | .0225 | | | .005 | D | | .008 | | | .0 | M | .0 | M | | |
| DH-29 | 8712-303 | 15.100 | J | | 17.000 | | | .0050 | | | .0125 | | | .050 | | | .053 | | | 510.0 | | 590.0 | | | |
| BLANK | 8712-302 | .004 | U | U | .020 | U | U | .0080 | | | .0125 | | | .008 | D | J | .008 | | | .0 | M | .0 | M | | |

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**Groundwater Data
East Helena Smelter Site**

**Samples Used In The Paired T-Test and
Linear Regression Analysis**

Table 2. Groundwater data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the parameters As, Cd and Cu. Only samples used in the paired t-test analysis are shown.

| Site ID | Sample Number | CLP As (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO As (mg/l) | ASRCO Lab Codes | ASRCO Rev. | CLP Cd (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Cd (mg/l) | ASRCO Lab Codes | ASRCO Rev. | CLP Cu (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Cu (mg/l) | ASRCO Lab Codes | ASRCO Rev. |
|--------------|---------------|---------------|---------------|----------|-----------------|-----------------|------------|---------------|---------------|----------|-----------------|-----------------|------------|---------------|---------------|----------|-----------------|-----------------|------------|
| EH-50 | 8611-8 | | | | | | | | | | | | | | | | | | |
| EH-50(REP) | 8611-9 | | | | | | | | | | | | | | | | | | |
| EH-51 | 8610-150 | .900 | | | .970 | | | | | | | | | | | | | | |
| EH-52 | 8611-15 | | 1.150 | | | 1.010 | | | | | | | | | | | | | |
| EH-53 | 8611-17 | | | | | | | | | | | | | | | | | | |
| EH-53(REP) | 8611-18 | | | | | | | | | | | | | | | | | | |
| EH-54 | 8611-32 | | .011 | | | .013 | | | | | | | | | | | | | |
| EH-54(REP) | 8611-35 | | .011 | | | .012 | | | | | | | | | | | | | |
| EH-58 | 8612-11 | | | | | | | | | | | | | | | | | | |
| EH-100 | 8611-12 | | | | | | | | | | | | | | | | | | |
| EH-100(REP) | 8611-13 | | | | | | | | | | | | | | | | | | |
| EH-101 | 8610-148 | | | | | | | | | | | | | | | | | | |
| EH-101(REP) | 8610-149 | | | | | | | | | | | | | | | | | | |
| EH-102 | 8611-14 | | | | | | | | | | | | | | | | | | |
| WOJCIK | 8610-111 | | | | | | | | | | | | | | | | | | |
| R LAMPING | 8610-141 | | | | | | | | | | | | | | | | | | |
| DUEL | 8610-110 | | | | | | | | | | | | | | | | | | |
| AM CH 4 | 8610-106 | | | | | | | | | | | | | | | | | | |
| NORDSTROM | 8610-142 | | | | | | | | | | | | | | | | | | |
| ROMASKO | 8610-113 | | | | | | | | | | | | | | | | | | |
| WESTON/RADLY | 8610-112 | | | | | | | | | | | | | | | | | | |
| JNSN A2 | 8610-117 | | | | | | | | | | | | | | | | | | |
| ERNST | 8610-115 | | | | | | | | | | | | | | | | | | |
| VETSCH | 8610-116 | | | | | | | | | | | | | | | | | | |
| BERRY | 8610-114 | | | | | | | | | | | | | | | | | | |
| HELPFERT | 8610-109 | | | | | | | | | | | | | | | | | | |
| MANION | 8610-118 | | | | | | | | | | | | | | | | | | |
| HOFF | 8610-119 | | | | | | | | | | | | | | | | | | |
| AM CH 2 | 8610-105 | | | | | | | | | | | | | | | | | | |
| D.HULST | 8610-107 | .017 | | | | .019 | | | | | | | | | | | | | |
| D.HULST(REP) | 8610-101 | .018 | | | | .019 | | | | | | | | | | | | | |

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Table 2. Continued.

| Site ID | Sample Number | CLP | | | ASRCO | | | CLP | | | ASRCO | | | CLP | | | ASRCO | | |
|--------------|---------------|---------|-------|-------|---------|-------|-------|--------|-------|-------|--------|-------|-------|--------|-------|-------|--------|-------|-------|
| | | As | Lab | Rev. | As | Lab | Rev. | Cd | Lab | Rev. | Cd | Lab | Rev. | Cu | Lab | Rev. | Cu | Lab | Rev. |
| | | (mg/l) | Codes | Codes | (mg/l) | Codes | Codes | (mg/l) | Codes | Codes | (mg/l) | Codes | Codes | (mg/l) | Codes | Codes | (mg/l) | Codes | Codes |
| DH-1 | 8611-21 | | | | | | | | | | | | | | | | | | |
| DH-2 | 8611-22 | | | | | | | | | | | | | | | | | | |
| DH-3 | 8611-23 | | | | | | | | | | | | | | | | | | |
| DH-4 | 8611-24 | 4.500 | | | 4.532 | | | | | | | | | | | | | | |
| DH-5 | 8611-25 | .540 | | | .600 | | | | | | | | | | | | | | |
| DH-6 | 8611-26 | 4.600 | | | 5.300 | | | | | | | | | | | | | | |
| DH-6(REP) | 8611-36 | 4.600 | | | 5.000 | | | | | | | | | | | | | | |
| DH-7 | 8611-27 | | | | | | | | | | | | | | | | | | |
| DH-7(REP) | 8611-34 | | | | | | | | | | | | | | | | | | |
| DH-8 | 8611-28 | .037 | | | .036 | | | | | | | | | | | | | | |
| DH-9 | 8611-29 | 6.400 | | | 6.500 | | | | | | | | | | | | | | |
| DH-10 | 8611-30 | 4.300 | | | 4.375 | | | | | | | | | | | | | | |
| DH-11 | 8611-31 | | | | | | | | | | | | | | | | | | |
| DH-12 | 8611-19 | 130.000 | | | 148.000 | | | | | | | | | | | | | | |
| DH-13 | 8611-10 | 130.000 | | | 160.000 | | | | | | | | | | | | | | |
| DH-14 | 8611-2 | .042 | | | .033 | | | | | | | | | | | | | | |
| DH-14(REP) | 8611-3 | .037 | | | .030 | | | | | | | | | | | | | | |
| DH-15 | 8611-5 | | | | | | | | | | | | | | | | | | |
| DH-15(REP) | 8611-6 | | | | | | | | | | | | | | | | | | |
| DH-17 | 8612-2 | 78.000 | | | 87.500 | | | | | | | | | | | | | | |
| DH-17(REP) | 8612-3 | 78.000 | | | 87.500 | | | | | | | | | | | | | | |
| DH-18 | 8612-9 | | | | | | | | | | | | | | | | | | |
| E HEL 1 | 8612-7 | | | | | | | | | | | | | | | | | | |
| E HEL 2 | 8612-4 | | | | | | | | | | | | | | | | | | |
| E HEL 2(REP) | 8612-5 | | | | | | | | | | | | | | | | | | |
| EH-52 | 8611-45 | 1.300 | | | 1.400 | | | | | | | | | | | | | | |
| EH-52(REP) | 8611-33 | 1.300 | | | 1.400 | | | | | | | | | | | | | | |
| ASRCO W | 8701-116 | .027 | | | .024 | | | | | | | | | | | | | | |
| DH-13 | 8701-101 | 134.000 | | | 173.000 | | | .0054 | | | .0040 | | | .0250 | | | .0080 | | |
| DH-18 | 8701-105 | | | | | | | | | | | | | | | | | | |
| EH-102 | 8701-111 | | | | | | | | | | | | | | | | | | |

0081090

Table 2. Continued.

| Site ID | Sample Number | CLP As (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO As (mg/l) | ASRCO Lab Codes | ASRCO Rev. | CLP Cd (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Cd (mg/l) | ASRCO Lab Codes | ASRCO Rev. | CLP Cu (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Cu (mg/l) | ASRCO Lab Codes | ASRCO Rev. |
|--------------|---------------|---------------|---------------|----------|-----------------|-----------------|------------|---------------|---------------|----------|-----------------|-----------------|------------|---------------|---------------|----------|-----------------|-----------------|------------|
| EH-52 | 8701-110 | 1.640 | S | | 1.330 | | | | | | | | | | | | | | |
| EH-54 | 8701-114 | | | | | | | | | | | | | | | | | | |
| EH-58 | 8701-115 | | | | | | | | | | | | | | | | | | |
| KMMRMAN | 8701-118 | | | | | | | | | | | | | | | | | | |
| EH-102(REP) | 8701-139 | | | | | | | | | | | | | | | | | | |
| FMD SLG | 8704-20 | .020 | | | | .028 | | .0720 | | | .0600 | | | .2260 | | | .1930 | | |
| UNFMD SLG | 8704-24 | .513 | N | | | .620 | | .0063 | | | .0300 | | | .1190 | | | .1300 | | |
| EH-101 | 8704-30 | | | | | | | | | | | | | | | | | | |
| EH-51 | 8704-31 | .079 | N | | | .107 | | | | | | | | | | | | | |
| EH-54 | 8704-18 | | | | | | | | | | | | | | | | | | |
| EH-51(REP) | 8704-32 | .078 | N | | | .092 | | | | | | | | | | | | | |
| MANION | 8704-150 | | | | | | | | | | | | | | | | | | |
| ERNST | 8704-47 | | | | | | | | | | | | | | | | | | |
| SIMAC | 8704-52 | | | | | | | | | | | | | .0380 | | | .0080 | | |
| ASRCO W | 8704-39 | .010 | D | J | | .010 | O | | | | | | | | | | | | |
| L.HULST(REP) | 8705-41 | .034 | N | J | | .019 | 1 | | | | | | | .0450 | | | .0080 | | |
| L.HULST | 8705-2 | .034 | N | J | | .050 | 1 | | | | | | | | | | | | |
| K.HULST | 8705-3 | | | | | | | | | | | | | | | | | | |
| D.HULST | 8705-1 | .012 | N | J | | .021 | | | | | | | | | | | | | |
| E HEL 2 | 8704-58 | | | | | | | | | | | | | | | | | | |
| STCLAIR(REP) | 8704-61 | .037 | N | J | | .044 | | | | | | | | | | | | | |
| E HEL 1 | 8704-57 | | | | | | | | | | | | | | | | | | |
| STCLAIR | 8704-54 | .035 | N | J | | .037 | | | | | | | | | | | | | |
| DH-20 | 8705-31 | .105 | N | J | | .115 | A | | | | | | | .0010 | | | | | |
| DH-20(REP) | 8705-103 | .075 | | | | .101 | | | | | | | | | | | | | |
| EH-59(REP) | 8705-112 | | | | | | | | | | | | | | | | | | |
| EH-59 | 8705-40 | | | | | | | | | | | | | | | | | | |
| DH-23 | 8705-33 | 8.173 | | | | 7.810 | | .2100 | | | .2200 | | | .0580 | | | .0230 | | |
| FMD SLG | 8705-47 | .052 | A | J | | .030 | | .0520 | | | .0510 | | | .1480 | | | .1280 | | |
| FMD SLG(REP) | 8705-50 | .032 | N | J | | .038 | | .0500 | | | .0510 | | | .1340 | | | .1250 | | |
| UMFMD SLG | 8705-48 | .083 | S | J | | .353 | | | | | | | | | | | | | |

1610801

Table 2. Continued.

| Site ID | Sample Number | CLP | | | ASRCO | | | CLP | | | ASRCO | | | CLP | | | ASRCO | | |
|--------------|---------------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|-------|--------------|--------------|------|
| | | As (mg/l) | Lab Codes | Rev. | As (mg/l) | Lab Codes | Rev. | Cd (mg/l) | Lab Codes | Rev. | Cd (mg/l) | Lab Codes | Rev. | Cu (mg/l) | Lab Codes | Rev. | Cu (mg/l) | Lab Codes | Rev. |
| DH-3 | 8706-5 | .014 | A | J | .013 | | | | | | | | | | | | | | |
| DH-15 | 8706-15 | | | | | | | | | | | | | | | | | | |
| DH-15(REP) | 8706-36 | | | | | | | | | | | | | | | | | | |
| DH-6 | 8706-8 | 5.170 | 0 | J | 4.650 | | | | | | | | | | | | | | |
| DH-12 | 8706-12 | 195.000 | 0 | J | 186.000 | | | .0070 | | | .0088 | | | .0250 | D | .0100 | | | |
| DH-17 | 8706-16 | 114.000 | 0 | J | 111.300 | | | | | | | | | | | | | | |
| DH-26 | 8706-100 | | | | | | | 2.5200 | | | 2.3100 | | | .0410 | | | | | |
| DH-27 | 8706-22 | 52.400 | 0 | J | 49.500 | | | | | | | | | | | | | | |
| DH-21 | 8706-101 | 304.000 | 0 | J | 283.000 | | | | | | | | | | | | | | |
| DH-22 | 8706-19 | 8.580 | 0 | J | 9.100 | | | 4.9000 | | | 5.0000 | | | .0740 | | .0410 | | | |
| DH-19 | 8706-18 | 53.700 | 0 | J | 51.300 | | | 6.5800 | | | 6.8500 | | | .0440 | | .0100 | | | |
| DH-24 | 8706-20 | | | | | | | .3580 | | | .4200 | | | .0330 | | .0200 | | | |
| BLANK | 8706-29 | .022 | | | .008 | | | | | | | | | | | | | | |
| DH-24(REP) | 8706-39 | 81.800 | 0 | J | 79.400 | | | .3720 | | | .3650 | | | .0530 | | .0180 | | | |
| EH-53 | 8708-18 | | | | | | | | | | | | | | | | | | |
| BLANK | 8708-31 | | | | | | | | | | | | | | | | | | |
| EH-59 | 8708-21 | | | | | | | .0008 | J | | .0010 | | | | | | | | |
| EH-52 | 8708-17 | 1.080 | | | 1.230 | | | | | | | | | | | | | | |
| EH-52(REP) | 8708-43 | 1.120 | | | 1.000 | | | .0009 | J | | .0010 | | | | | | | | |
| BLANK | 8708-34 | | | | | | | | | | | | | | | | | | |
| DH-14 | 8708-3 | .005 | D | | .006 | | | | | | | | | | | | | | |
| DH-14(REP) | 8708-46 | .004 | D | | .016 | | | | | | | | | | | | | | |
| DH-24 | 8708-12 | 43.200 | | | 75.000 | | | .5240 | | | .2720 | | | .0150 | N | J | .0150 | | |
| DH-19 | 8708-7 | 66.600 | | | 66.000 | | | 10.4000 | | | 7.5500 | | | | | | | | |
| DH-26 | 8708-13 | 60.800 | | | 61.000 | | | 3.2000 | | | 1.8000 | | | | | | | | |
| DH-26(REP) | 8708-49 | 61.000 | | | 58.800 | | | 2.5200 | | | 1.9500 | | | | | | | | |
| BLANK | 8710-69 | | | | | | | | | | | | | | | | | | |
| AM CH 2 | 8710-51 | | | | | | | | | | | | | | | | | | |
| AM CH 2(REP) | 8710-72 | | | | | | | .0010 | UN | | .0010 | | | | | | | | |
| BLANK | 8710-71 | | | | | | | .0002 | D | | .0010 | | | | | | | | |
| WALTER | 8710-65 | | | | | | | | | | | | | .0100 | D | | .0140 | | |

0080192

Table 2. Continued.

| Site ID | Sample Number | CLP As (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO As (mg/l) | ASRCO Lab Codes | ASRCO Rev. | CLP Cd (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Cd (mg/l) | ASRCO Lab Codes | ASRCO Rev. | CLP Cu (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Cu (mg/l) | ASRCO Lab Codes | ASRCO Rev. |
|-------------|------------------|---------------------|---------------------|-------------|-----------------------|-----------------------|---------------|---------------------|---------------------|-------------|-----------------------|-----------------------|---------------|---------------------|---------------------|-------------|-----------------------|-----------------------|---------------|
| WALTER(REP) | 8710-74 | .003 | N | | .007 | | | | | | | | | .0200 | D | | .0140 | | |
| HELPERT | 8710-67 | .004 | N | | .009 | | | | | | | | | .0170 | D | | .0190 | | |
| STCLAIR | 8710-68 | .059 | N | | .063 | | | | | | | | | .0150 | D | | .0100 | | |
| EH-54 | 8711-204 | | | | | | | | | | | | | | | | | | |
| BLANK | 8711-209 | | | | | | | | | | | | | | | | | | |
| EH-50 | 8711-200 | | | | | | | .0001 | D | | .0010 | | | .0042 | D | | .0100 | | |
| EH-50(REP) | 8711-213 | | | | | | | .0002 | D | | .0010 | | | .0033 | D | | .0100 | | |
| EH-100 | 8711-206 | .003 | D | | .020 | | | .0001 | D | | .0010 | | | .0044 | D | | .0130 | | |
| BLANK | 8711-211 | | | | | | | | | | | | | .0070 | D | | .0090 | | |
| DH-1 | 8711-216 | | | | | | | | | | | | | | | | | | |
| DH-4 | 8711-219 | 4.300 | | | 4.380 | | | .0310 | | | .0030 | | | | | | | | |
| DH-10 | 8711-225 | 4.780 | | | 5.250 | | | .0350 | | | .0010 | | | | | | | | |
| DH-7 | 8711-222 | | | | | | | .0003 | D | | .0010 | | | | | | | | |
| BLANK | 8711-256 | .048 | J | | .054 | | | | | | | | | | | | | | |
| DH-13(REP) | 8711-253 | 145.000 | J | 180.000 | | | | .4120 | | | .0030 | | | | | | | | |
| DH-23 | 8711-238 | 2.920 | J | 3.000 | | | | .5060 | | | .3500 | | | .0200 | D | | .0180 | | |
| BLANK | 8712-258 | .012 | | | .018 | | | .0008 | D | | .0030 | | | | | | | | |
| EH-62 | 8712-247 | .006 | D | | .051 | | | .0078 | | J | .0140 | | | | | | | | |
| EH-60 | 8712-245 | 1.200 | | | 1.230 | | | .0100 | | J | .0100 | | | .0098 | D | | .0100 | | |
| EH-60(REP) | 8712-259 | 1.200 | | | 1.510 | | | .0100 | | J | .0060 | | | .0120 | D | | .0250 | | |
| EH-61 | 8712-246 | .009 | D | | .021 | | | .0037 | | | .0050 | | | .0083 | D | | .0080 | | |
| EH-57A | 8712-260 | .006 | D | | .103 | | | .0011 | D | | .0030 | | | | | | | | |
| EH-57A(REP) | 8712-261 | | | | | | | .0025 | | | .0040 | | | | | | | | |
| DH-28 | 8712-300 | 270.000 | | | 293.000 | | | | | | | | | | | | | | |
| DH-28(REP) | 8712-301 | 270.000 | | | 293.800 | | | | | | | | | | | | | | |
| DH-29 | 8712-303 | 18.400 | | | 18.900 | | | | | | | | | | | | | | |
| BLANK | 8712-302 | .005 | | | .010 | | | | | | | | | | | | | | |

0080193

Table 4. Groundwater data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCC for the parameters Fe, Pb, Zn and SO₄. Only samples used in the paired t-test analysis are shown.

| Site ID | Sample Number | CLP Fe (mg/l) | CLP Lab Codes | CLP Rev. | ASRCC Fe (mg/l) | ASRCC Lab Codes | ASRCC Rev. | CLP Pb (mg/l) | CLP Lab Codes | CLP Rev. | ASRCC Pb (mg/l) | ASRCC Lab Codes | ASRCC Rev. | CLP Zn (mg/l) | CLP Lab Codes | CLP Rev. | ASRCC Zn (mg/l) | ASRCC Lab Codes | ASRCC Rev. | CLP SO ₄ (mg/l) | CLP Lab Codes | CLP Rev. | ASRCC SO ₄ (mg/l) | ASRCC Lab Codes | |
|--------------|---------------|---------------|---------------|----------|-----------------|-----------------|------------|---------------|---------------|----------|-----------------|-----------------|------------|---------------|---------------|----------|-----------------|-----------------|------------|----------------------------|---------------|----------|------------------------------|-----------------|--|
| EH-50 | 8611-8 | | | | | | | | | | .009 | D | | .014 | | | 723.0 | | | 683.0 | | | | | |
| EH-50(REP) | 8611-9 | | | | | | | | | | .011 | D | | .015 | | | | | | | | | | | |
| EH-51 | 8610-150 | .042 | D | | .058 | | | | | | .046 | | | .052 | | | 577.0 | | | 546.0 | | | | | |
| EH-52 | 8611-15 | | | | | | | | | | .021 | | | .025 | | | 264.0 | | | 250.0 | | | | | |
| EH-53 | 8611-17 | | | | | | | | | | .020 | | | .024 | | | 509.0 | | | 488.0 | | | | | |
| EH-53(REP) | 8611-18 | | | | | | | | | | .019 | D | | .022 | | | | | | | | | | | |
| EH-54 | 8611-32 | | | | | | | | | | | | | | | | 61.0 | | | 52.0 | | | | | |
| EH-54(REP) | 8611-35 | | | | | | | | | | | | | | | | | | | | | | | | |
| EH-58 | 8612-11 | | | | | | | | | | .014 | D | | .013 | | | 177.0 | | | 125.0 | | | | | |
| EH-100 | 8611-12 | 1.530 | | | 1.512 | | | | | | .230 | | | .050 | | | 905.0 | | | 878.0 | | | | | |
| EH-100(REP) | 8611-13 | 1.500 | | | 1.550 | | | | | | .043 | | | .069 | | | | | | | | | | | |
| EH-101 | 8610-148 | | | | | | | | | | .012 | D | | .023 | | | 550.0 | | | 516.0 | | | | | |
| EH-101(REP) | 8610-149 | | | | | | | | | | .011 | D | | .018 | | | | | | | | | | | |
| EH-102 | 8611-14 | | | | | | | | | | | | | | | | 145.0 | | | 268.0 | | | | | |
| WOJCIK | 8610-111 | | | | | | | | | | .006 | D | | .012 | | | 58.0 | | | 60.0 | | | | | |
| R LAMPING | 8610-141 | | | | | | | | | | .011 | D | | .016 | | | 140.0 | | | 135.0 | | | | | |
| DUEL | 8610-110 | | | | | | | | | | | | | | | | 51.0 | | | 56.0 | | | | | |
| AM CH 4 | 8610-106 | | | | | | | | | | | | | | | | 21.0 | | | 25.0 | | | | | |
| NORDSTROM | 8610-142 | | | | | | | | | | .020 | | | .022 | | | 89.0 | | | 103.0 | | | | | |
| ROMASKO | 8610-113 | .137 | | | .138 | | | | | | .005 | D | | .008 | | | 309.0 | | | 384.0 | | | | | |
| WESTON/RADLY | 8610-112 | | | | | | | | | | .004 | D | | .010 | | | 83.0 | | | 101.0 | | | | | |
| JNSN A2 | 8610-117 | | | | | | | | | | .003 | D | | .009 | | | 142.0 | | | 141.0 | | | | | |
| ERNST | 8610-115 | 4.460 | | | 4.225 | | | | | | .006 | D | | .016 | | | 499.0 | | | 488.0 | | | | | |
| VETSCH | 8610-116 | 1.430 | | | 2.225 | | | | | | .004 | D | | .009 | | | 436.0 | | | 420.0 | | | | | |
| BERRY | 8610-114 | .931 | | | .912 | | | | | | .014 | D | | .021 | | | 491.0 | | | 476.0 | | | | | |
| HELFERT | 8610-109 | | | | | | | | | | .004 | D | | .009 | | | 97.0 | | | 95.0 | | | | | |
| MANION | 8610-118 | 3.390 | | | 2.075 | | | | | | .012 | D | | .015 | | | 801.0 | | | 500.0 | | | | | |
| HOFF | 8610-119 | | | | | | | | | | .020 | D | | .016 | | | 453.0 | | | 420.0 | | | | | |
| AM CH 2 | 8610-105 | .546 | | | .550 | | | | | | .051 | | | .054 | | | 61.0 | | | 29.0 | | | | | |
| D.HULST | 8610-107 | | | | | | | | | | | | | | | | 115.0 | | | 101.0 | | | | | |

0080194

Table 4. Continued.

| Site ID | Sample Number | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | | | | |
|--------------|---------------|--------------|-----|------|--------------|-----|------|--------------|-----|------|--------------|-----|------|--------------|-----|--------------|-------|--------------|------|-----------------|-----|-----------------|-------|--------------|--------|--------------|--------|-----------|
| | | Fe | Lab | Rev. | Fe | Lab | Rev. | Pb | Lab | Rev. | Pb | Lab | Rev. | Zn | Lab | Rev. | Zn | Lab | Rev. | SO ₄ | Lab | SO ₄ | Lab | ASR00 | ASR00 | | | |
| | | (mg/l) Codes | | | (mg/l) Codes | | | (mg/l) Codes | | | (mg/l) Codes | | | (mg/l) Codes | | (mg/l) Codes | | (mg/l) Codes | | (mg/l) Codes | | (mg/l) Codes | | (mg/l) Codes | | (mg/l) Codes | | |
| D.HULST(REP) | 8610-101 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DH-1 | 8611-21 | | | | | | | | | | | | | | | | | | | | | | | | | | M | |
| DH-2 | 8611-22 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DH-3 | 8611-23 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DH-4 | 8611-24 | 15.800 | | | 15.700 | | | | | | | | | | | | | | | | | | | | 101.0 | | | |
| DH-5 | 8611-25 | | | | | | | .0062 | | | .0070 | | | | | | | | | | | | | | 40.0 | 37.0 | | |
| DH-6 | 8611-26 | | | | | | | | | | | | | | | | | | | | | | | | | 614.0 | 630.0 | |
| DH-6(REP) | 8611-36 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DH-7 | 8611-27 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DH-7(REP) | 8611-34 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DH-8 | 8611-28 | | | | | | | | | | | | | | | | | | | | | | | | | | 1350.0 | |
| DH-9 | 8611-29 | | | | | | | | | | | | | | | | | | | | | | | | | | 1340.0 | |
| DH-10 | 8611-30 | .412 | | | .338 | | | | | | | | | | | | | | | | | | | | | | | |
| DH-11 | 8611-31 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DH-12 | 8611-19 | 1.780 | | | 19.000 | | | | | | | | | | | | | | | | | | | | | 3,450 | 1730.0 | |
| DH-13 | 8611-10 | 47.200 | | | 45.600 | | | | | | | | | | | | | | | | | | | | | 27.500 | 1530.0 | |
| DH-14 | 8611-2 | 4.380 | | | 3.900 | | | | | | | | | | | | | | | | | | | | | .156 | .099 | |
| DH-14(REP) | 8611-3 | 3.760 | J | | 4.100 | | | | | | | | | | | | | | | | | | | | | .094 | .100 | |
| DH-15 | 8611-5 | .286 | J | | .260 | | | | | | | | | | | | | | | | | | | | | .022 | .021 | |
| DH-15(REP) | 8611-6 | .289 | J | | .260 | | | | | | | | | | | | | | | | | | | | | .018 | .020 | |
| DH-17 | 8612-2 | 42.400 | | | 41.000 | | | | | | | | | | | | | | | | | | | | | 3,900 | 4,000 | |
| DH-17(REP) | 8612-3 | 41.800 | | | 41.000 | | | | | | | | | | | | | | | | | | | | | 3,900 | 4,000 | |
| DH-18 | 8612-9 | | | | | | | | | | | | | | | | | | | | | | | | | | .241 | .126 |
| E HEL 1 | 8612-7 | .122 | | | .104 | | | | | | | | | | | | | | | | | | | | | .007 | .009 | |
| E HEL 2 | 8612-4 | | | | | | | | | | | | | | | | | | | | | | | | | | .003 | .008 |
| E HEL 2(REP) | 8612-5 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EH-52 | 8611-45 | | | | | | | | | | | | | | | | | | | | | | | | | | .016 | .018 |
| EH-52(REP) | 8611-33 | | | | | | | | | | | | | | | | | | | | | | | | | | .014 | .014 |
| ASR00 W | 8701-116 | .894 | | | .890 | | | | | | | | | | | | | | | | | | | | | .069 | J .018 | |
| DH-13 | 8701-101 | 23.900 | | | 24.000 | | | | | | | | | | | | | | | | | | | | 13,600 | 12,800 | | |
| DH-18 | 8701-105 | | | | | | | | | | | | | | | | | | | | | | | | | | .022 | G .008 U* |

0010800

Table 4. Continued.

| Site ID | Sample Number | CLP Fe (mg/l) | CLP Lab Codes | CLP Rev. Codes | ASR00 Fe (mg/l) | ASR00 Lab Codes | ASR00 Rev. Codes | CLP Pb (mg/l) | CLP Lab Codes | CLP Rev. Codes | ASR00 Pb (mg/l) | ASR00 Lab Codes | ASR00 Rev. Codes | CLP Zn (mg/l) | CLP Lab Codes | CLP Rev. Codes | ASR00 Zn (mg/l) | ASR00 Lab Codes | ASR00 Rev. Codes | CLP SO ₄ (mg/l) | CLP Lab Codes | ASR00 SO ₄ (mg/l) | ASR00 Lab Codes | |
|--------------|------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|------------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|------------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|------------------------|----------------------------------|---------------------|------------------------------------|-----------------------|--|
| EH-102 | 8701-111 | | | | | | | | | | | | | .041 | G | J | .008 | U* | | | | | | |
| EH-52 | 8701-110 | .570 | N | J | .044 | | | .0039 | D | J | .0050 | 2 | | .130 | * | J | .010 | | | 93.2 | | 91.0 | | |
| EH-54 | 8701-114 | | | | | | | | | | | | | | | | | | | 55.8 | | 58.0 | | |
| EH-58 | 8701-115 | | | | | | | .0037 | D | J | .0050 | 0 | | .098 | G | J | .008 | * | | 94.9 | | 95.0 | | |
| KMMRMAN | 8701-118 | .254 | N | J | .225 | | | .0037 | D | J | .0050 | 0 | | .096 | G | J | .031 | * | | 132.0 | | 130.0 | | |
| EH-102(REP) | 8701-139 | | | | | | | .0030 | D | J | .0050 | 0 | | .234 | G | J | .008 | U* | | | | | | |
| FMD SLG | 8704-20 | | | | | | | .0334 | | | .0300 | | | 4.450 | | | 3.700 | | | 1240.0 | | 1425.0 | | |
| UNFMD SLG | 8704-24 | | | | | | | .1230 | N | J | .0980 | | | .090 | | | .100 | | | 2480.0 | | 9200.0 | | |
| EH-101 | 8704-30 | | | | | | | | | | | | | | | | | | | 476.0 | | 420.0 | | |
| EH-51 | 8704-31 | | | | | | | | | | | | | | | | | | | 417.0 | | 460.0 | | |
| EH-54 | 8704-18 | | | | | | | | | | | | | | | | | | | 48.0 | | 61.0 | | |
| EH-51(REP) | 8704-32 | | | | | | | | | | | | | .020 | | | .013 | | | | | | | |
| MANION | 8704-150 | 1.600 | | | 1.450 | | | | | | | | | .032 | | | .040 | | | 910.0 | | 980.0 | | |
| ERNST | 8704-47 | 1.450 | | | 1.250 | | | | | | | | | | | | | | | 480.0 | | 550.0 | | |
| SIMAC | 8704-52 | | | | | | | | | | | | | .089 | | | .081 | | | 76.1 | | 90.0 | | |
| ASR00 W | 8704-39 | 1.450 | | | 1.290 | | | | | | | | | | | | | | | 22.7 | | 21.0 | | |
| L.HULST(REP) | 8705-41 | | | | | | | | | | | | | | | | | | | | | | | |
| L.HULST | 8705-2 | | | | | | | | | | | | | | | | | | | 47.7 | | 57.0 | | |
| K.HULST | 8705-3 | | | | | | | | | | | | | | | | | | | 95.0 | | 104.0 | | |
| D.HULST | 8705-1 | | | | | | | | | | | | | | | | | | | 72.0 | | 70.0 | | |
| E HEL 2 | 8704-58 | | | | | | | | | | | | | | | | | | | 42.8 | | 53.0 | | |
| STCLAIR(REP) | 8704-61 | | | | | | | | | | | | | .047 | | | .040 | | | | | | | |
| E HEL 1 | 8704-57 | | | | | | | | | | | | | | | | | | | 55.1 | | 64.0 | | |
| STCLAIR | 8704-54 | | | | | | | | | | | | | .048 | | | .038 | | | 130.0 | | 136.0 | | |
| DH-20 | 8705-31 | 2.610 | | | 3.380 | | | | | | | | | | | | | | | 135.0 | | 7.0 | | |
| DH-20(REP) | 8705-103 | 3.010 | | | 3.630 | | | | | | | | | | | | | | | | | | | |
| EH-59(REP) | 8705-112 | | | | | | | .0310 | S | J | .0090 | | | | | | | | | | | | | |
| EH-59 | 8705-40 | | | | | | | | | | | | | | | | | | | 110.0 | | 106.0 | | |
| DH-23 | 8705-33 | | | | | | | .0820 | S | J | .0475 | | | 3.110 | | | 3.000 | | | 5.3 | | 610.0 | | |
| FMD SLG | 8705-47 | | | | | | | .0323 | N | J | .0200 | | | 2.860 | | | 2.890 | | | 1304.0 | | 1338.0 | | |
| FMD SLG(REP) | 8705-50 | | | | | | | .0432 | N | J | .0190 | | | 2.820 | | | 2.830 | | | | | | | |

0080196

Table 4. Continued.

| Site ID | Sample Number | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | | CLP | | | ASR00 | | | | | | | |
|--------------|---------------|--------------|-----|------|--------------|-----|------|--------------|-----|------|--------------|-----|------|--------------|--------|--------|--------------|--------|--------|-----------------|--------|-----------------|--------------|--------|--------|--------|--------|-------|-------|------|
| | | Fe | Lab | Rev. | Fe | Lab | Rev. | Pb | Lab | Rev. | Pb | Lab | Rev. | Zn | Lab | Rev. | Zn | Lab | Rev. | SO ₄ | Lab | SO ₄ | Lab | ASR00 | ASR00 | | | | | |
| | | (mg/l) Codes | | | (mg/l) Codes | | | (mg/l) Codes | | | (mg/l) Codes | | | (mg/l) Codes | | | (mg/l) Codes | | | (mg/l) Codes | | | (mg/l) Codes | | | | | | | |
| UMFMD SLG | 8705-48 | | | | | | | | | | | | | | | | | | | | | | | 2463.0 | 1200.0 | | | | | |
| DH-3 | 8706-5 | | | | | | | | | | | | | | | | | | | | | | | 57.6 | 69.0 | | | | | |
| DH-15 | 8706-15 | .826 | | | .700 | | | | | | | | | | | | | | | | | | | | 393.8 | 430.0 | | | | |
| DH-15(REP) | 8706-36 | .882 | | | .725 | | | | | | | | | | | | | | | | | | | | | | | | | |
| DH-6 | 8706-8 | | | | | | | | | | | | | | | | | | | | | | | | | 504.5 | 625.0 | | | |
| DH-12 | 8706-12 | .792 | | | .480 | | | | | | | | | | | | | | | | | | | | 1294.5 | 2250.0 | | | | |
| DH-17 | 8706-16 | 13.500 | | | 14.100 | | | | | | | | | | | | | | | | | | | | 1523.8 | 1550.0 | | | | |
| DH-26 | 8706-100 | 56.100 | | | 53.000 | | | .0500 | A | J | .0440 | | | 35.700 | | | 35.300 | | | 1264.1 | | | | | 1338.0 | | | | | |
| DH-27 | 8706-22 | 51.900 | | | 43.300 | | | | | | | | | | 8.330 | | | 7.180 | | | 1798.3 | | | | | 1788.0 | | | | |
| DH-21 | 8706-101 | .478 | | | .373 | | | | | | | | | | .082 | | | .010 | | | 2573.1 | | | | | 2188.0 | | | | |
| DH-22 | 8706-19 | .285 | | | .144 | | | | | | | | | | 3.314 | | | 3.160 | | | 617.0 | | | | | 725.0 | | | | |
| DH-19 | 8706-18 | 45.400 | | | 46.200 | | | .0920 | | | .0900 | | | | 32.820 | | | 33.000 | | | 887.0 | | | | | 1025.0 | | | | |
| DH-24 | 8706-20 | 63.500 | | | 52.500 | | | | | | | | | | 31.370 | | | 32.000 | | | 1530.0 | | | | | 1550.0 | | | | |
| BLANK | 8706-29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DH-24(REP) | 8706-39 | 64.600 | | | 52.000 | | | | | | | | | | 31.960 | | | 32.000 | | | | | | | | | | | | |
| EH-53 | 8708-18 | | | | | | | | | | | | | | | | | | | | | | | | | 940.0 | H | 960.0 | | |
| BLANK | 8708-31 | .011 | D | | .024 | | | | | | | | | | | | | | | | | | | | | | | | | |
| EH-59 | 8708-21 | | | | | | | | | | | | | | | | | | | | | | | | | 62.0 | H | 66.0 | | |
| EH-52 | 8708-17 | | | | | | | | | | | | | | | .012 | D | | .012 | | | | | | | | 190.0 | H | 187.0 | |
| EH-52(REP) | 8708-43 | .017 | D | | .023 | | | | | | | | | | | .012 | | | .015 | | | | | | | | | | | |
| BLANK | 8708-34 | .013 | | | .025 | | | | | | | | | | | .005 | | | .008 | | | | | | | | | | | |
| DH-14 | 8708-3 | .271 | | | .273 | | | | | | | | | | | .007 | J | | .010 | | | | | | | | | 16.0 | H | 10.0 |
| DH-14(REP) | 8708-46 | .239 | | | .320 | | | | | | | | | | | .011 | D | J | | .010 | | | | | | | | | | |
| DH-24 | 8708-12 | 67.300 | | | 57.600 | | | | | | | | | | | 32.000 | | | 35.800 | | | 1600.0 | H | | | | 1640.0 | | | |
| DH-19 | 8708-7 | 45.400 | | | 45.300 | | | .0890 | | | .0940 | | | | | 32.500 | | | 32.500 | | | 920.0 | H | | | | 930.0 | | | |
| DH-26 | 8708-13 | 64.400 | | | 49.800 | | | .0220 | | | .0170 | | | | | 32.300 | | | 33.800 | | | 1500.0 | H | | | | 1480.0 | | | |
| DH-26(REP) | 8708-49 | 62.800 | | | 57.000 | | | .0270 | | | .0175 | | | | | 31.200 | | | 31.500 | | | | | | | | | | | |
| BLANK | 8710-69 | .012 | D | | .024 | | | | | | | | | | | | | | | | | | | | | | | | | |
| AM CH 2 | 8710-51 | .781 | | | .988 | | | | | | | | | | | .071 | | | .069 | | | | | | | | | | | |
| AM CH 2(REP) | 8710-72 | .503 | | | .735 | | | | | | | | | | | .067 | | | .070 | | | | | | | | | | | |
| BLANK | 8710-71 | | | | | | | | | | | | | | | .008 | D | | .018 | | | | | | | | | | | |

0080197

Table 4. Continued.

| Site ID | Sample Number | CLP Fe (mg/l) | CLP Lab Codes | CLP Rev. Codes | ASRCO Fe (mg/l) | ASRCO Lab Codes | ASRCO Rev. Codes | CLP Pb (mg/l) | CLP Lab Codes | CLP Rev. Codes | ASRCO Pb (mg/l) | ASRCO Lab Codes | ASRCO Rev. Codes | CLP Zn (mg/l) | CLP Lab Codes | CLP Rev. Codes | ASRCO Zn (mg/l) | ASRCO Lab Codes | CLP SO ₄ (mg/l) | CLP Lab Codes | ASRCO SO ₄ (mg/l) | ASRCO Lab Codes | |
|-------------|------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|------------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|------------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|----------------------------------|---------------------|------------------------------------|-----------------------|--|
| WALTER | 8710-65 | .028 | D | | .044 | | | | | | | | | .119 | | | .095 | | 41.0 | | 49.0 | | |
| WALTER(REP) | 8710-74 | .027 | D | | .035 | | | | | | | | | .168 | | | .075 | | | | | | |
| HELFERT | 8710-67 | .023 | D | | .028 | | | | | | | | | .012 | D | J | .013 | | 75.0 | | 78.0 | | |
| STCLAIR | 8710-68 | .041 | D | | .066 | | | | | | | | | .055 | | | .049 | | 110.0 | | 114.0 | | |
| EH-54 | 8711-204 | | | | | | | | | | | | | .006 | D | J | .008 | | 40.0 | H | 45.0 | | |
| BLANK | 8711-209 | | | | | | | | | | | | | | | | | | | | | | |
| EH-50 | 8711-200 | .005 | D | | .036 | | | | | | | | | | | | | | 980.0 | H | 970.0 | | |
| EH-50(REP) | 8711-213 | | | | | | | | | | | | | | | | | | | | | | |
| EH-100 | 8711-206 | .290 | | | .183 | | | .0030 | D | | .0125 | | | .573 | | | .078 | | 1000.0 | H | 1030.0 | | |
| BLANK | 8711-211 | | | | | | | | | | | | | .005 | D | | .009 | | | | | | |
| DH-1 | 8711-216 | .008 | D | | .036 | | | | | | | | | | | | | | 850.0 | H | 840.0 | | |
| DH-4 | 8711-219 | 13.000 | | | 11.500 | | | | | | | | | | | | | | 60.0 | H | 73.0 | | |
| DH-10 | 8711-225 | .007 | D | | .069 | | | | | | | | | .026 | | | .024 | | 86.0 | H | 95.0 | | |
| DH-7 | 8711-222 | | | | | | | | | | | | | .019 | D | | .010 | | 44.0 | | 46.0 | | |
| BLANK | 8711-256 | .009 | D | | .025 | | | | | | | | | .009 | D | | .009 | | | | | | |
| DH-13(REP) | 8711-253 | 12.800 | | | 8.660 | | | | | | | | | 7.320 | | | 6.290 | | | | | | |
| DH-23 | 8711-238 | .151 | | | .099 | | | .0650 | | .0350 | | | | 7.040 | | | 6.200 | | 770.0 | | 750.0 | | |
| BLANK | 8712-258 | | | | | | | | | | | | | .008 | | | .015 | | | | | | |
| EH-62 | 8712-247 | .005 | D | | .036 | | | | | | | | | .019 | D | | .020 | | 320.0 | | 340.0 | | |
| EH-60 | 8712-245 | .006 | D | | .041 | | | | | | | | | .085 | | | .115 | | 730.0 | | 750.0 | | |
| EH-60(REP) | 8712-259 | .006 | D | | .033 | | | | | | | | | .034 | | | .043 | | | | | | |
| EH-61 | 8712-246 | .610 | | | .043 | | | | | | | | | .026 | | | .030 | | 570.0 | | 560.0 | | |
| EH-57A | 8712-260 | | | | | | | | | | | | | | | | | | 58.0 | | 65.0 | | |
| EH-57A(REP) | 8712-261 | .004 | D | | .021 | | | | | | | | | .009 | D | | .024 | | | | | | |
| DH-28 | 8712-300 | .388 | | J | .450 | | | | | | | | | .005 | D | | .008 | | 3260.0 | | 4150.0 | | |
| DH-28(REP) | 8712-301 | .489 | | J | .500 | | | | | | | | | .005 | D | | .008 | | | | | | |
| DH-29 | 8712-303 | 15.100 | | J | 17.000 | | | .0050 | | .0125 | | | | .050 | | | .053 | | 510.0 | | 590.0 | | |
| BLANK | 8712-302 | | | | | | | .0080 | | .0125 | | | | .008 | D | J | .008 | | | | | | |

0080198

0080199

**Process Water
Total Metals
East Helena Smelter Site**

Full Data Base

Table 1. Process water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the total metals As, Cd and Cu. The full data set is shown.

| Site ID | Sample Number | CLP | | ASRCO | | CLP | | ASRCO | | CLP | | ASRCO | |
|--------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|
| | | As (mg/l) | Lab Codes | As (mg/l) | Lab Codes | Cd (mg/l) | Lab Codes | Cd (mg/l) | Lab Codes | Cu (mg/l) | Lab. Codes | Cu (mg/l) | Lab Codes |
| LL-1 | 8705-133 | 14.7000 | 0 | 17.2000 | | .4080 | | .4190 | | .1310 | | .1400 | |
| AP-2 | 8705-6 | 3475.0000 | 0 | 3000.0000 | | 145.0000 | | 167.5000 | | .1090 | | .1500 | |
| S-2 | 8705-9 | 23.5000 | 0 | 23.0000 | | 2.6500 | | 3.3500 | | 4.5700 | | 6.8500 | |
| S-1 | 8705-10 | 17.4000 | 0 | 17.6000 | | .5810 | | .6500 | | .7550 | | .6630 | |
| LL-2(REP) | 8705-132 | 17.7600 | 0 | 17.2000 | | .6390 | | .6250 | | .2280 | | .8750 | |
| LL-2 | 8705-131 | 18.0000 | 0 | 17.5000 | | .5920 | | .6190 | | .1930 | | .6760 | |
| ST-1 | 8705-12 | 18.5000 | 0 | 18.7500 | | 1.3100 | | 1.3300 | | .0860 | | .1160 | |
| SPEISS PIT | 8705-8 | 2858.5000 | 0 | 3800.0000 | | .0040 | U | .3000 | | .0170 | U | 4.5000 | |
| SP-1 | 8705-7 | 3330.0000 | 0 | 3750.0000 | | .0040 | U | .4000 | | .0170 | U | 28.3000 | |
| TRCK WSH SMP | 8705-11 | 5.0000 | GA | .6200 | | 86.5000 | | 103.4000 | | .2620 | | .4240 | |
| LOWER LAKE | 8612-12 | 20.5000 | V | 20.0000 | | .8780 | 7 | 1.0250 | | .1800 | V | .1840 | |
| BLANK | 8612-15 | .0214 | 7 | .0060 | U | .0050 | UV | .0010 | U | .0170 | UV | .0060 | U |
| S-2 | 8612-20 | 17.9000 | V | 18.0000 | | 1.9300 | 7 | 2.1880 | | .3930 | V | .6630 | |
| SCRUB FLUID | 8612-21 | 2710.0000 | V | 2800.0000 | | 487.0000 | V | 550.0000 | | .0360 | V | .0200 | |
| SP-1 | 8612-22 | 57.5000 | V | 55.0000 | | .1190 | K | .1130 | | 3.2600 | V | 4.1250 | |
| S-3 | 8710-100 | 76.5000 | | 75.0000 | | .9040 | N | 1.0100 | | 6.2700 | | 8.7000 | |
| BLANK | 8710-16 | .0250 | | .0080 | | .0007 | N | .0010 | | .0110 | D | .0080 | U |
| TT-1 | 8710-3 | 19.4000 | | 19.6000 | | .9860 | N | 1.0100 | | .5290 | | .8730 | |
| AP-1 | 8710-5 | .0700 | | .0600 | | .0170 | N | .0190 | | .0430 | | .0450 | |
| AP-2 | 8710-6 | 1670.0000 | | 1960.0000 | | 284.0000 | N | 275.0000 | | .9880 | | 3.6900 | |
| AP-3 | 8710-11 | 17.0000 | | 18.3000 | | .6790 | N | .6730 | | .2140 | | .2450 | |
| BLANK | 8710-17 | .0200 | | .0140 | | .0004 | N | .0010 | | .0072 | D | .0080 | U |
| ZP-1 | 8710-13 | 13.5000 | | 15.3000 | | .3780 | N | .3430 | | 1.2800 | | 1.5300 | |
| ST-2 | 8710-10 | 80.5000 | | 104.0000 | | 10.6000 | N | 9.7500 | | .7370 | | .7750 | |
| BLANK | 8711-26 | .1360 | | .0075 | | .0010 | U | .0040 | | .0071 | D | .0080 | U |
| LL-1 | 8711-11 | 22.1000 | | 23.8000 | | 5.0900 | | 4.8000 | | 2.7500 | | 2.8800 | |
| LL-2 | 8711-12 | 19.6000 | | 23.3000 | | 1.6200 | | 3.3500 | | .1450 | | .1910 | |
| ST-1 | 8711-21 | 8.6400 | | 9.3800 | | 1.2100 | | 1.1500 | | .2030 | | .2310 | |
| BLANK | 8711-27 | .4940 | | .0080 | | .0018 | D | .0010 | | .0100 | D | .0080 | U |

0080200

Table 1. Continued.

| Site ID | Sample Number | CLP | | ASRCO | | CLP | | ASRCO | | CLP | | ASRCO | |
|-----------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|
| | | As (mg/l) | Lab Codes | As (mg/l) | Lab Codes | Cd (mg/l) | Lab Codes | Cd (mg/l) | Lab Codes | Cu (mg/l) | Lab. Codes | Cu (mg/l) | Lab Codes |
| SP-1 | 8711-14 | 1560.0000 | | 1000.0000 | | 3.9000 | | .0200 | | 1.0800 | | .9750 | |
| SP-1(REP) | 8711-25 | 1530.0000 | | 1094.0000 | | 2.2400 | | .0180 | | .9560 | | .9550 | |
| ZP-1 | 8711-63 | 41.5000 | | .0000 | M | 7.9800 | | .0000 | M | 37.2000 | E | .0000 | M |
| LL-1 | 8711-51 | 21.2000 | | .0000 | M | 5.0000 | | .0000 | M | 2.6100 | | .0000 | M |
| LL-2 | 8711-52 | 16.5000 | | .0000 | M | .8580 | | .0000 | M | .1140 | E | .0000 | M |
| LL-2(REP) | 8711-64 | 18.0000 | | .0000 | M | .9050 | | .0000 | M | .1290 | E | .0000 | M |
| AP-1 | 8711-55 | .4100 | S | .0000 | M | .2050 | | .0000 | M | .0544 | E | .0000 | M |
| ST-1 | 8711-61 | 14.0000 | | 16.4000 | | 14.3000 | | 14.8000 | | .1450 | E | .3990 | |
| TT-1 | 8711-53 | 40.0000 | T | 41.3000 | | 1.0600 | | 1.1000 | | .1560 | E | 1.7300 | |
| S-1 | 8711-58 | 34.8000 | | 42.5000 | | .5400 | | .5490 | | 1.3000 | E | 1.4300 | |
| S-2 | 8711-59 | 18.0000 | | .0000 | M | .8210 | | .0000 | M | .1220 | | .0000 | M |
| S-2(REP) | 8711-65 | 17.5000 | | .0000 | M | .8190 | | .0000 | M | .1420 | | .0000 | M |
| S-3 | 8711-60 | 21.3000 | | .0000 | M | .2170 | | .0000 | M | .0836 | E | .0000 | M |
| AP-2 | 8711-56 | 2370.0000 | | 2300.0000 | | 111.0000 | | 110.0000 | | .3600 | UE | .1170 | |
| AP-3 | 8711-57 | 19.4000 | | .0000 | M | .8110 | | .0000 | M | .0988 | E | .0000 | M |
| AP-3(REP) | 8711-71 | 17.0000 | S | .0000 | M | .8010 | | .0000 | M | .0889 | E | .0000 | M |
| ST-2 | 8711-62 | 19.6000 | | .0000 | M | .8800 | | .0000 | M | .2980 | | .0000 | M |
| SP-1 | 8711-54 | 94.0000 | | .0000 | M | .0320 | | .0000 | M | .1380 | E | .0000 | M |
| BLANK | 8712-26 | .0020 | U | .0230 | | .0030 | U | .0010 | | .0068 | D | .0080 | U |
| AP-2 | 8712-16 | 1700.0000 | | 2050.0000 | | 42.6000 | | 37.5000 | | .1340 | | .1480 | |
| S-1 | 8712-18 | 36.0000 | | 35.8000 | | .3630 | | .2900 | | .3800 | | .6150 | |
| S-2 | 8712-19 | 18.3000 | | 21.1000 | | .4500 | | .4250 | | .3110 | | .2740 | |
| S-2(REP) | 8712-25 | 18.0000 | | 20.9000 | | .4340 | | .3890 | | .2190 | | .2110 | |
| AP-1 | 8712-75 | .1510 | | .1330 | | .0450 | | .0310 | | .0690 | | .0730 | |
| ST-2 | 8712-82 | 90.3000 | | 93.8000 | | 6.8300 | | 7.2500 | | 1.5000 | | 2.3300 | |
| ST-2(REP) | 8712-84 | 89.4000 | | 93.1000 | | 6.8100 | | 7.2500 | | 1.5600 | | 2.3500 | |
| BLANK | 8712-86 | .0050 | D | .1200 | | .0030 | U | .0010 | U | .0036 | D | .0080 | U |

0080201

Table 2. Process water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the total metals Fe, Pb, Zn and sulfate. The full data set is shown.

| Site ID | Sample Number | CLP Fe (mg/l) | CLP Lab Codes | ASRCO Fe (mg/l) | ASRCO Lab Codes | CLP Pb (mg/l) | CLP Lab | ASRCO Pb (mg/l) | ASRCO Lab | CLP Zn (mg/l) | CLP Lab. | ASRCO Zn (mg/l) | ASRCO Lab | CLP SO ₄ (mg/l) | CLP Lab | ASRCO SO ₄ (mg/l) | ASRCO Lab |
|--------------|---------------|---------------|---------------|-----------------|-----------------|---------------|---------|-----------------|-----------|---------------|----------|-----------------|-----------|----------------------------|---------|------------------------------|-----------|
| LL-1 | 8705-133 | .708 | | .578 | | .9300 | * | .8630 | | 1.340 | * | 1.240 | | 516.0 | X | 560.0 | |
| AP-2 | 8705-6 | 21.000 | | 23.000 | | 11.6000 | * | 17.5000 | | 5.130 | * | 57.500 | | 2156.0 | X | 5000.0 | |
| S-2 | 8705-9 | 5.970 | | 5.450 | | 13.0000 | * | 17.0000 | | 7.670 | * | 9.200 | | 795.0 | X | 575.0 | |
| S-1 | 8705-10 | 1.190 | | .888 | | 1.7000 | * | 1.5400 | | 1.940 | * | 1.850 | | 551.0 | X | 570.0 | |
| LL-2(REP) | 8705-132 | .888 | | 1.500 | | 1.4200 | * | 2.4100 | | 2.080 | * | 2.290 | | .0 | M | .0 | M |
| LL-2 | 8705-131 | .810 | | 1.260 | | 1.1300 | * | 1.8400 | | 1.890 | * | 2.210 | | 548.0 | X | 620.0 | |
| ST-1 | 8705-12 | .482 | | .404 | | .7870 | P | 36.5000 | | 4.310 | * | 4.500 | | 442.0 | X | 440.0 | |
| SPEISS PIT | 8705-8 | .100 | U | 3.750 | | .1530 | N | 1.7500 | | .020 | U* | 1.100 | | 1727.0 | X | 1620.0 | |
| SP-1 | 8705-7 | .100 | U | 12.550 | | .5000 | A | 14.0000 | | .020 | U* | 5.350 | | 2022.0 | X | 1590.0 | |
| TRCK WSH SMP | 8705-11 | .592 | | .517 | | 2.6800 | * | 3.2500 | | 301.000 | * | 330.000 | | 2049.0 | X | 380.0 | |
| LOWER LAKE | 8612-12 | .602 | V | .538 | | 1.2500 | V | 1.3500 | | 2.090 | V | 2.000 | | 565.0 | Q | 537.0 | |
| BLANK | 8612-15 | .039 | UV | .025 | | .0048 | V | .0050 | U | .010 | UV | .017 | UN | .0 | MQ | .0 | M |
| S-2 | 8612-20 | 1.640 | V | 1.325 | | 4.1600 | V | 48.0000 | | 5.620 | V | 5.700 | | 783.0 | Q | 580.0 | |
| SCRUB FLUID | 8612-21 | 11.900 | V | 8.300 | | 8.4200 | V | 24.0000 | | 142.000 | V | 145.000 | | 2270.0 | Q | 2675.0 | |
| SP-1 | 8612-22 | .653 | V | .625 | | 2.1900 | V | 24.0000 | | 1.000 | V | .663 | | 649.0 | Q | 660.0 | |
| S-3 | 8710-100 | 3.920 | | 4.200 | | 7.2400 | L | 11.0000 | | 6.340 | L | 7.330 | | 1400.0 | | 2060.0 | |
| BLANK | 8710-16 | .010 | D | .020 | | .0060 | L | .0050 | U | .008 | | .008 | U | .0 | M | .0 | M |
| TT-1 | 8710-3 | 2.000 | | 2.430 | | 9.0900 | L | 11.6000 | | 3.450 | L | 4.450 | | 720.0 | | 790.0 | |
| AP-1 | 8710-5 | .283 | | .363 | | .2580 | L | .2580 | | .095 | L | .115 | | 49.0 | | 57.0 | |
| AP-2 | 8710-6 | 40.300 | | 47.000 | | 449.0000 | L | 843.0000 | | 58.400 | L | 62.300 | | 2200.0 | | 3950.0 | |
| AP-3 | 8710-11 | 1.190 | | .848 | | 2.2400 | L | 2.5000 | | 2.290 | L | 2.380 | | 690.0 | | 690.0 | |
| BLANK | 8710-17 | .006 | | .020 | | .0210 | L | .0050 | U | .000 | | .008 | U | .0 | M | .0 | M |
| ZP-1 | 8710-13 | 4.420 | | 3.880 | | 4.9300 | L | 4.9300 | | 7.550 | L | 7.180 | | 1000.0 | | 1080.0 | |
| ST-2 | 8710-10 | 3.930 | | 2.600 | | 6.7000 | L | 6.7500 | | 6.750 | L | 6.100 | | 870.0 | | 890.0 | |
| BLANK | 8711-26 | .010 | D | .021 | | .0030 | D | .0050 | U | .006 | D | .013 | | .0 | M | .0 | M |
| LL-1 | 8711-11 | 11.200 | | 7.500 | | 45.9000 | | 46.3000 | | 17.400 | | 19.000 | | 790.0 | | 876.0 | |
| LL-2 | 8711-12 | 1.130 | | .881 | | 1.5800 | | 1.6600 | | 2.040 | | 2.280 | | 640.0 | | 766.0 | |
| ST-1 | 8711-21 | .908 | | .860 | | 3.2200 | | 2.9600 | | 3.230 | | 3.180 | | 560.0 | | 577.0 | |
| BLANK | 8711-27 | .025 | D | .020 | U | .0750 | | .0050 | U | .044 | | .008 | U | .0 | M | .0 | M |

0080202

Table 2. Continued.

| Site ID | Sample Number | CLP | CLP | ASRCO | ASRCO | CLP | CLP | ASRCO | ASRCO | CLP | CLP | ASRCO | ASRCO | CLP | CLP | ASRCO | ASRCO |
|-----------|---------------|---------|-----|--------------|-------|----------|--------------|---------|-------|---------|-----|--------|-------|--------|-----|-----------------|-------|
| | | Fe | Lab | (mg/l) Codes | Fe | Lab | (mg/l) Codes | Pb | Lab | Pb | Lab | Zn | Lab. | Zn | Lab | SO ₄ | Lab |
| SP-1 | 8711-14 | .154 | | .943 | | .5980 | | 1.8750 | | .252 | | .263 | | 1100.0 | | 1085.0 | |
| SP-1(REP) | 8711-25 | .252 | | .985 | | .7080 | | 1.7550 | | .242 | | .250 | | .0 | M | 1388.0 | |
| ZP-1 | 8711-63 | 129.000 | | .000 | M | 130.0000 | | .0000 | M | 221.000 | | .000 | M | .0 | M | 1280.0 | |
| LL-1 | 8711-51 | 11.200 | | .000 | M | 48.3000 | | .0000 | M | 23.200 | | .000 | M | .0 | M | 790.0 | |
| LL-2 | 8711-52 | .642 | | .000 | M | 1.7500 | | .0000 | M | 1.460 | | .000 | M | .0 | M | 730.0 | |
| LL-2(REP) | 8711-64 | .700 | | .000 | M | 1.8600 | | .0000 | M | 1.510 | | .000 | M | .0 | M | 740.0 | |
| AP-1 | 8711-55 | .336 | | .000 | M | .3100 | | .0000 | M | .426 | | .000 | M | .0 | M | 700.0 | |
| ST-1 | 8711-61 | 4.820 | | 3.000 | | 2.7600 | | 7.4000 | | 66.900 | | 74.000 | | .0 | M | 1850.0 | |
| TT-1 | 8711-53 | 1.440 | | 3.300 | | 4.7700 | | 21.9000 | | 2.510 | | 4.560 | | .0 | M | 830.0 | |
| S-1 | 8711-58 | 10.400 | | 6.260 | | 1.9900 | | 2.0900 | | 2.600 | | 2.530 | | .0 | M | 600.0 | |
| S-2 | 8711-59 | 1.340 | | .000 | M | 1.6700 | | .0000 | M | 1.590 | | .000 | M | .0 | M | 696.0 | |
| S-2(REP) | 8711-65 | 1.180 | | .000 | M | 1.6400 | | .0000 | M | 1.600 | | .000 | M | .0 | M | 800.0 | |
| S-3 | 8711-60 | .086 | D | .000 | M | .1500 | | .0000 | M | 2.360 | | .000 | M | .0 | M | 4400.0 | |
| AP-2 | 8711-56 | 24.400 | | 17.600 | | 26.2000 | | 20.7000 | | 21.400 | | 19.700 | | .0 | M | 2460.0 | |
| AP-3 | 8711-57 | .655 | | .000 | M | 1.6500 | | .0000 | M | 1.450 | | .000 | M | .0 | M | 2550.0 | |
| AP-3(REP) | 8711-71 | .631 | | .000 | M | 1.6300 | | .0000 | M | 1.440 | | .000 | M | .0 | M | 790.0 | |
| ST-2 | 8711-62 | 1.290 | | .000 | M | 3.9700 | | .0000 | M | 2.020 | | .000 | M | .0 | M | 740.0 | |
| SP-1 | 8711-54 | .070 | D | .000 | M | .2570 | | .0000 | M | .091 | | .000 | M | .0 | M | 760.0 | |
| BLANK | 8712-26 | .015 | D | .025 | | .0049 | D | .0050 | U | .005 | D | .013 | | .0 | M | .0 | M |
| AP-2 | 8712-16 | 36.600 | | 42.500 | | 20.7000 | | 17.3300 | | 7.210 | | 6.600 | | 2000.0 | | 3000.0 | |
| S-1 | 8712-18 | 7.760 | | 3.880 | | .8760 | | 1.2800 | | 1.720 | | 1.650 | | 560.0 | | 580.0 | |
| S-2 | 8712-19 | 1.890 | | 1.190 | | 1.9400 | | 1.6300 | | 1.030 | | .950 | | 690.0 | | 710.0 | |
| S-2(REP) | 8712-25 | 1.430 | | 1.130 | | 1.6900 | | 1.6100 | | .929 | | .850 | | .0 | M | 690.0 | |
| AP-1 | 8712-75 | .868 | | .825 | | .4330 | | .3250 | | .183 | | .163 | | 100.0 | | 102.0 | |
| ST-2 | 8712-82 | 5.050 | | 6.080 | | 28.3000 | | 34.4000 | | 7.420 | | 9.000 | | 1080.0 | | 1130.0 | |
| ST-2(REP) | 8712-84 | 4.920 | | 6.150 | | 31.0000 | | 35.6000 | | 7.600 | | 9.300 | | .0 | M | 1100.0 | |
| BLANK | 8712-86 | .004 | U | .026 | | .0050 | | .0050 | U | .006 | D | .009 | | .0 | M | .0 | M |

0080203

0080204

**Process Water
Total Metals
East Helena Smelter Site**

**Samples Used In The Paired T-Test and
Linear Regression Analysis**

Table 3. Process water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the total metals As, Cd and Cu. Only samples used in the paired t-test analysis are shown.

| Site ID | Sample Number | CLP | | ASRCO | | CLP | | ASRCO | | CLP | | ASRCO | |
|--------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|
| | | As (mg/l) | Lab Codes | As (mg/l) | Lab Codes | Cd (mg/l) | Lab Codes | Cd (mg/l) | Lab Codes | Cu (mg/l) | Lab. Codes | Cu (mg/l) | Lab Codes |
| LL-1 | 8705-133 | 14.7000 | 0 | 17.2000 | | .4080 | | .4190 | | .1310 | | .1400 | |
| AP-2 | 8705-6 | 3475.0000 | 0 | 3000.0000 | | 145.0000 | | 167.5000 | | .1090 | | .1500 | |
| S-2 | 8705-9 | 23.5000 | 0 | 23.0000 | | 2.6500 | | 3.3500 | | 4.5700 | | 6.8500 | |
| S-1 | 8705-10 | 17.4000 | 0 | 17.6000 | | .5810 | | .6500 | | .7550 | | .6630 | |
| LL-2(REP) | 8705-132 | 17.7600 | 0 | 17.2000 | | .6390 | | .6250 | | .2280 | | .8750 | |
| LL-2 | 8705-131 | 18.0000 | 0 | 17.5000 | | .5920 | | .6190 | | .1930 | | .6760 | |
| ST-1 | 8705-12 | 18.5000 | 0 | 18.7500 | | 1.3100 | | 1.3300 | | .0860 | | .1160 | |
| SPEISS PIT | 8705-8 | 2858.5000 | 0 | 3800.0000 | | | | | | | | | |
| SP-1 | 8705-7 | 3330.0000 | 0 | 3750.0000 | | | | | | | | | |
| TRCK WSH SMP | 8705-11 | 5.0000 | GA | .6200 | | 86.5000 | | 103.4000 | | .2620 | | .4240 | |
| LOWER LAKE | 8612-12 | 20.5000 | V | 20.0000 | | .8780 | 7 | 1.0250 | | .1800 | V | .1840 | |
| BLANK | 8612-15 | | | | | | | | | | | | |
| S-2 | 8612-20 | 17.9000 | V | 18.0000 | | 1.9300 | 7 | 2.1880 | | .3930 | V | .6630 | |
| SCRUB FLUID | 8612-21 | 2710.0000 | V | 2800.0000 | | 487.0000 | V | 550.0000 | | .0360 | V | .0200 | |
| SP-1 | 8612-22 | 57.5000 | V | 55.0000 | | .1190 | K | .1130 | | 3.2600 | V | 4.1250 | |
| S-3 | 8710-100 | 76.5000 | | 75.0000 | | .9040 | N | 1.0100 | | 6.2700 | | 8.7000 | |
| BLANK | 8710-16 | .0250 | | .0080 | | .0007 | N | .0010 | | | | | |
| TT-1 | 8710-3 | 19.4000 | | 19.6000 | | .9860 | N | 1.0100 | | .5290 | | .8730 | |
| AP-1 | 8710-5 | .0700 | | .0600 | | .0170 | N | .0190 | | .0430 | | .0450 | |
| AP-2 | 8710-6 | 1670.0000 | | 1960.0000 | | 284.0000 | N | 275.0000 | | .9880 | | 3.6900 | |
| AP-3 | 8710-11 | 17.0000 | | 18.3000 | | .6790 | N | .6730 | | .2140 | | .2450 | |
| BLANK | 8710-17 | .0200 | | .0140 | | .0004 | N | .0010 | | | | | |
| ZP-1 | 8710-13 | 13.5000 | | 15.3000 | | .3780 | N | .3430 | | 1.2800 | | 1.5300 | |
| ST-2 | 8710-10 | 80.5000 | | 104.0000 | | 10.6000 | N | 9.7500 | | .7370 | | .7750 | |
| BLANK | 8711-26 | .1360 | | .0075 | | | | | | | | | |
| LL-1 | 8711-11 | 22.1000 | | 23.8000 | | 5.0900 | | 4.8000 | | 2.7500 | | 2.8800 | |
| LL-2 | 8711-12 | 19.6000 | | 23.3000 | | 1.6200 | | 3.3500 | | .1450 | | .1910 | |
| ST-1 | 8711-21 | 8.6400 | | 9.3800 | | 1.2100 | | 1.1500 | | .2030 | | .2310 | |

0080205

Table 3. Continued.

| Site ID | Sample Number | CLP As (mg/l) | CLP Lab Codes | ASRCO As (mg/l) | ASRCO Lab Codes | CLP Cd (mg/l) | CLP Lab Codes | ASRCO Cd (mg/l) | ASRCO Lab Codes | CLP Cu (mg/l) | CLP Lab. Codes | ASRCO Cu (mg/l) | ASRCO Lab Codes |
|------------|------------------|---------------------|---------------------|-----------------------|-----------------------|---------------------|---------------------|-----------------------|-----------------------|---------------------|----------------------|-----------------------|-----------------------|
| BLANK | 8711-27 | .4940 | | .0080 | | .0018 | D | .0010 | | | | | |
| SP-1 | 8711-14 | 1560.0000 | | 1000.0000 | | 3.9000 | | .0200 | | 1.0800 | | .9750 | |
| SP-1(REP) | 8711-25 | 1530.0000 | | 1094.0000 | | 2.2400 | | .0180 | | .9560 | | .9550 | |
| ZP-1 | 8711-63 | | | | | | | | | | | | |
| LL-1 | 8711-51 | | | | | | | | | | | | |
| LL-2 | 8711-52 | | | | | | | | | | | | |
| LL-2(REP) | 8711-64 | | | | | | | | | | | | |
| AP-1 | 8711-55 | | | | | | | | | | | | |
| ST-1 | 8711-61 | 14.0000 | | 16.4000 | | 14.3000 | | 14.8000 | | .1450 | E | .3990 | |
| TT-1 | 8711-53 | 40.0000 | T | 41.3000 | | 1.0600 | | 1.1000 | | .1560 | E | 1.7300 | |
| S-1 | 8711-58 | 34.8000 | | 42.5000 | | .5400 | | .5490 | | 1.3000 | E | 1.4300 | |
| S-2 | 8711-59 | | | | | | | | | | | | |
| S-2(REP) | 8711-65 | | | | | | | | | | | | |
| S-3 | 8711-60 | | | | | | | | | | | | |
| AP-2 | 8711-56 | 2370.0000 | | 2300.0000 | | 111.0000 | | 110.0000 | | | | | |
| AP-3 | 8711-57 | | | | | | | | | | | | |
| AP-3(REP) | 8711-71 | | | | | | | | | | | | |
| ST-2 | 8711-62 | | | | | | | | | | | | |
| SP-1 | 8711-54 | | | | | | | | | | | | |
| BLANK | 8712-26 | | | | | | | | | | | | |
| AP-2 | 8712-16 | 1700.0000 | | 2050.0000 | | 42.6000 | | 37.5000 | | .1340 | | .1480 | |
| S-1 | 8712-18 | 36.0000 | | 35.8000 | | .3630 | | .2900 | | .3800 | | .6150 | |
| S-2 | 8712-19 | 18.3000 | | 21.1000 | | .4500 | | .4250 | | .3110 | | .2740 | |
| S-2(REP) | 8712-25 | 18.0000 | | 20.9000 | | .4340 | | .3890 | | .2190 | | .2110 | |
| AP-1 | 8712-75 | .1510 | | .1330 | | .0450 | | .0310 | | .0690 | | .0730 | |
| ST-2 | 8712-82 | 90.3000 | | 93.8000 | | 6.8300 | | 7.2500 | | 1.5000 | | 2.3300 | |
| ST-2(REP) | 8712-84 | 89.4000 | | 93.1000 | | 6.8100 | | 7.2500 | | 1.5600 | | 2.3500 | |
| BLANK | 8712-86 | .0050 | D | .1200 | | | | | | | | | |

6020800

Table 4. Process water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the total metals Fe, Pb, Zn and sulfate. Only samples used in the paired t-test analysis are shown.

| Site ID | Sample Number | CLP Fe (mg/l) | CLP Lab Codes | ASRCO Fe (mg/l) | ASRCO Lab Codes | CLP Pb (mg/l) | CLP Lab | ASRCO Pb (mg/l) | ASRCO Lab Codes | CLP Zn (mg/l) | CLP Lab. | ASRCO Zn (mg/l) | ASRCO Lab | CLP SO ₄ (mg/l) | CLP Lab Codes | ASRCO SO ₄ (mg/l) | ASRCO Lab Codes |
|--------------|---------------|---------------|---------------|-----------------|-----------------|---------------|---------|-----------------|-----------------|---------------|----------|-----------------|-----------|----------------------------|---------------|------------------------------|-----------------|
| LL-1 | 8705-133 | .708 | | .578 | | .9300 | * | .8630 | | 1.340 | * | 1.240 | | 516.0 | X | 560.0 | |
| AP-2 | 8705-6 | 21.000 | | 23.000 | | 11.6000 | * | 17.5000 | | 5.130 | * | 57.500 | | 2156.0 | X | 5000.0 | |
| S-2 | 8705-9 | 5.970 | | 5.450 | | 13.0000 | * | 17.0000 | | 7.670 | * | 9.200 | | 795.0 | X | 575.0 | |
| S-1 | 8705-10 | 1.190 | | .888 | | 1.7000 | * | 1.5400 | | 1.940 | * | 1.850 | | 551.0 | X | 570.0 | |
| LL-2(REP) | 8705-132 | .888 | | 1.500 | | 1.4200 | * | 2.4100 | | 2.080 | * | 2.290 | | | | | |
| LL-2 | 8705-131 | .810 | | 1.260 | | 1.1300 | * | 1.8400 | | 1.890 | * | 2.210 | | 548.0 | X | 620.0 | |
| ST-1 | 8705-12 | .482 | | .404 | | .7870 | P | 36.5000 | | 4.310 | * | 4.500 | | 442.0 | X | 440.0 | |
| SPEISS PIT | 8705-8 | | | | | .1530 | N | 1.7500 | | | | | | 1727.0 | X | 1620.0 | |
| SP-1 | 8705-7 | | | | | .5000 | A | 14.0000 | | | | | | 2022.0 | X | 1590.0 | |
| TRCK WSH SMP | 8705-11 | .592 | | .517 | | 2.6800 | * | 3.2500 | | 301.000 | * | 330.000 | | 2049.0 | X | 380.0 | |
| LOWER LAKE | 8612-12 | .602 | V | .538 | | 1.2500 | V | 1.3500 | | 2.090 | V | 2.000 | | 565.0 | Q | 537.0 | |
| BLANK | 8612-15 | | | | | | | | | | | | | | | | |
| S-2 | 8612-20 | 1.640 | V | 1.325 | | 4.1600 | V | 48.0000 | | 5.620 | V | 5.700 | | 783.0 | Q | 580.0 | |
| SCRUB FLUID | 8612-21 | 11.900 | V | 8.300 | | 8.4200 | V | 24.0000 | | 142.000 | V | 145.000 | | 2270.0 | Q | 2675.0 | |
| SP-1 | 8612-22 | .653 | V | .625 | | 2.1900 | V | 24.0000 | | 1.000 | V | .663 | | 649.0 | Q | 660.0 | |
| S-3 | 8710-100 | 3.920 | | 4.200 | | 7.2400 | L | 11.0000 | | 6.340 | L | 7.330 | | 1400.0 | | 2060.0 | |
| BLANK | 8710-16 | .010 | D | .020 | | | | | | | | | | | | | |
| TT-1 | 8710-3 | 2.000 | | 2.430 | | 9.0900 | L | 11.6000 | | 3.450 | L | 4.450 | | 720.0 | | 790.0 | |
| AP-1 | 8710-5 | .283 | | .363 | | .2580 | L | .2580 | | .095 | L | .115 | | 49.0 | | 57.0 | |
| AP-2 | 8710-6 | 40.300 | | 47.000 | | 449.0000 | L | 843.0000 | | 58.400 | L | 62.300 | | 2200.0 | | 3950.0 | |
| AP-3 | 8710-11 | 1.190 | | .848 | | 2.2400 | L | 2.5000 | | 2.290 | L | 2.380 | | 690.0 | | 690.0 | |
| BLANK | 8710-17 | .006 | | .020 | | | | | | | | | | | | | |
| ZP-1 | 8710-13 | 4.420 | | 3.880 | | 4.9300 | L | 4.9300 | | 7.550 | L | 7.180 | | 1000.0 | | 1080.0 | |
| ST-2 | 8710-10 | 3.930 | | 2.600 | | 6.7000 | L | 6.7500 | | 6.750 | L | 6.100 | | 870.0 | | 890.0 | |
| BLANK | 8711-26 | .010 | D | .021 | | | | | | | | | | .006 | D | .013 | |
| LL-1 | 8711-11 | 11.200 | | 7.500 | | 45.9000 | | 46.3000 | | 17.400 | | 19.000 | | 790.0 | | 876.0 | |
| LL-2 | 8711-12 | 1.130 | | .881 | | 1.5800 | | 1.6600 | | 2.040 | | 2.280 | | 640.0 | | 766.0 | |
| ST-1 | 8711-21 | .908 | | .860 | | 3.2200 | | 2.9600 | | 3.230 | | 3.180 | | 560.0 | | 577.0 | |

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Table 4. Continued.

| Site ID | Sample Number | CLP Fe (mg/l) | CLP Lab Codes | ASRCO Fe (mg/l) | ASRCO Lab Codes | CLP Pb (mg/l) | CLP Lab Codes | ASRCO Pb (mg/l) | ASRCO Lab Codes | CLP Zn (mg/l) | CLP Lab Codes | ASRCO Zn (mg/l) | ASRCO Lab Codes | CLP SO ₄ (mg/l) | CLP Lab Codes | ASRCO SO ₄ (mg/l) | ASRCO Lab Codes |
|-----------|---------------|---------------|---------------|-----------------|-----------------|---------------|---------------|-----------------|-----------------|---------------|---------------|-----------------|-----------------|----------------------------|---------------|------------------------------|-----------------|
| BLANK | 8711-27 | | | | | | | | | | | | | | | | |
| SP-1 | 8711-14 | .154 | | .943 | | .5980 | | 1.8750 | | .252 | | .263 | | 1100.0 | | 1085.0 | |
| SP-1(REP) | 8711-25 | .252 | | .985 | | .7080 | | 1.7550 | | .242 | | .250 | | | | | |
| ZP-1 | 8711-63 | | | | | | | | | | | | | | | | |
| LL-1 | 8711-51 | | | | | | | | | | | | | | | | |
| LL-2 | 8711-52 | | | | | | | | | | | | | | | | |
| LL-2(REP) | 8711-64 | | | | | | | | | | | | | | | | |
| AP-1 | 8711-55 | | | | | | | | | | | | | | | | |
| ST-1 | 8711-61 | 4.820 | | 3.000 | | 2.7600 | | 7.4000 | | 66.900 | | 74.000 | | | | | |
| TT-1 | 8711-53 | 1.440 | | 3.300 | | 4.7700 | | 21.9000 | | 2.510 | | 4.560 | | | | | |
| S-1 | 8711-58 | 10.400 | | 6.260 | | 1.9900 | | 2.0900 | | 2.600 | | 2.530 | | | | | |
| S-2 | 8711-59 | | | | | | | | | | | | | | | | |
| S-2(REP) | 8711-65 | | | | | | | | | | | | | | | | |
| S-3 | 8711-60 | | | | | | | | | | | | | | | | |
| AP-2 | 8711-56 | 24.400 | | 17.600 | | 26.2000 | | 20.7000 | | 21.400 | | 19.700 | | | | | |
| AP-3 | 8711-57 | | | | | | | | | | | | | | | | |
| AP-3(REP) | 8711-71 | | | | | | | | | | | | | | | | |
| ST-2 | 8711-62 | | | | | | | | | | | | | | | | |
| SP-1 | 8711-54 | | | | | | | | | | | | | | | | |
| BLANK | 8712-26 | .015 | D | .025 | | | | | | .005 | D | .013 | | | | | |
| AP-2 | 8712-16 | 36.600 | | 42.500 | | 20.7000 | | 17.3300 | | 7.210 | | 6.600 | | 2000.0 | | 3000.0 | |
| S-1 | 8712-18 | 7.760 | | 3.880 | | .8760 | | 1.2800 | | 1.720 | | 1.650 | | 560.0 | | 580.0 | |
| S-2 | 8712-19 | 1.890 | | 1.190 | | 1.9400 | | 1.6300 | | 1.030 | | .950 | | 690.0 | | 710.0 | |
| S-2(REP) | 8712-25 | 1.430 | | 1.130 | | 1.6900 | | 1.6100 | | .929 | | .850 | | | | | |
| AP-1 | 8712-75 | .868 | | .825 | | .4330 | | .3250 | | .183 | | .163 | | 100.0 | | 102.0 | |
| ST-2 | 8712-82 | 5.050 | | 6.080 | | 28.3000 | | 34.4000 | | 7.420 | | 9.000 | | 1080.0 | | 1130.0 | |
| ST-2(REP) | 8712-84 | 4.920 | | 6.150 | | 31.0000 | | 35.6000 | | 7.600 | | 9.300 | | | | | |
| BLANK | 8712-86 | | | | | | | | | .006 | D | .009 | | | | | |

0080208

0080209

**Process Water
Dissolved Metals
East Helena Smelter Site**

Full Data Base

Table 5. Process water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCo for the dissolved metals As, Cd and Cu. The full data set is shown.

| Site ID | Sample Number | CLP As (mg/l) | CLP Lab Codes | ASRCo As (mg/l) | ASRCo Lab | CLP Cd (mg/l) | CLP Lab Codes | ASRCo Cd (mg/l) | ASRCo Lab | CLP Cu (mg/l) | CLP Lab. | ASRCo Cu (mg/l) | ASRCo Lab |
|---------------------|---------------|---------------|---------------|-----------------|-----------|---------------|---------------|-----------------|-----------|---------------|----------|-----------------|-----------|
| LL-1 | 8705-133 | 15.3000 | 0 | 16.3000 | | .0510 | | .1840 | | .0230 | D | .1390 | |
| AP-2 | 8705-6 | 2590.0000 | 0 | 2867.0000 | | 147.0000 | | 153.0000 | | .1100 | | .0770 | |
| S-2 | 8705-9 | 17.5000 | 0 | 16.9000 | | .0080 | | .0140 | | .0330 | | .0110 | |
| S-1 | 8705-10 | 15.2000 | 0 | 15.0000 | | .0420 | | .0450 | | .0360 | | .0190 | |
| LL-2(REP) | 8705-132 | 15.2000 | 0 | 15.0000 | | .0410 | | .0490 | | .0310 | | .0210 | |
| LL-2 | 8705-131 | 14.8000 | 0 | 15.3100 | | .0440 | | .0490 | | .0380 | | .0200 | |
| ST-1 | 8705-12 | 17.0000 | 0 | 16.5600 | | .8150 | | .7130 | | .0490 | | .0210 | |
| SPEISS PIT | 8705-8 | 3650.0000 | 0 | 3733.0000 | | .0040 | U | .1070 | | .0170 | U | .1070 | |
| SP-1 | 8705-7 | 3330.0000 | 0 | 3733.0000 | | .0040 | U | .0930 | | .0280 | | .1070 | |
| TRCK WSH SMP8705-11 | | .3260 | A | .5100 | | 90.7000 | | 93.5000 | | .0600 | | .0700 | |
| LOWER LAKE | 8612-12 | 18.3000 | * | 20.0000 | | .6330 | * | .7500 | | .0440 | * | .0280 | |
| BLANK | 8612-15 | .0090 | U* | .0060 | UN | .0050 | U* | .0010 | U | .0170 | U* | .0060 | U |
| S-2 | 8612-20 | 14.0000 | * | 15.0000 | | 1.4700 | * | 1.6880 | | .0420 | * | .0230 | |
| SCRUB FLUID | 8612-21 | 2400.0000 | * | 2750.0000 | | 407.0000 | * | 550.0000 | | .0300 | * | .0130 | |
| SP-1 | 8612-22 | 55.9000 | * | 55.0000 | | .0050 | U* | .0280 | | .0310 | * | .0090 | |
| S-3 | 8710-100 | 84.0000 | | 68.5000 | | .1360 | N | .0250 | | 1.2800 | | .9270 | |
| BLANK | 8710-16 | .0250 | | .0060 | U | .0010 | | .0010 | U | .0061 | | .0080 | U |
| TT-1 | 8710-3 | 16.4000 | | 20.1000 | | .6550 | N | .6840 | | .1790 | | .1890 | |
| AP-1 | 8710-5 | .0680 | | .0350 | | .0090 | N | .0113 | | .0170 | D | .0360 | |
| AP-2 | 8710-6 | 1820.0000 | | 1803.0000 | | 229.0000 | N | 235.0000 | | .0140 | D | .0500 | |
| AP-3 | 8710-11 | 15.1000 | | 16.8000 | | .4510 | N | .4060 | | .0250 | D | .0240 | |
| BLANK | 8710-17 | .0040 | D | .0140 | | .0007 | N | .0010 | U | .0044 | D | .0080 | U |
| ZP-1 | 8710-13 | 11.4000 | | 13.1300 | | .0720 | N | .0575 | | .0520 | | .0410 | |
| ST-2 | 8710-10 | 97.0000 | | 102.0000 | | 9.9500 | N | 9.6300 | | .0340 | | .0310 | |
| BLANK | 8711-26 | .0090 | R | .0075 | | .0010 | D | .0010 | | .0085 | D | .0080 | U |
| LL-1 | 8711-11 | 16.8000 | R | 18.0000 | | 2.4100 | | 2.2500 | | .0120 | D | .0130 | |
| LL-2 | 8711-12 | 18.2000 | R | 19.3000 | | .4760 | | .4410 | | .0180 | D | .0200 | |
| ST-1 | 8711-21 | 6.9600 | R | 7.6000 | | .7240 | | .7100 | | .0190 | D | .0190 | |
| BLANK | 8711-27 | .0360 | R | .0060 | U | .0010 | U | .0010 | | .0076 | D | .0080 | U |

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Table 5. Continued.

| Site ID | Sample Number | CLP | | ASRCO | | CLP | | ASRCO | | CLP | | ASRCO | |
|-----------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|
| | | As (mg/l) | Lab Codes | As (mg/l) | Lab Codes | Cd (mg/l) | Lab Codes | Cd (mg/l) | Lab Codes | Cu (mg/l) | Lab. Codes | Cu (mg/l) | Lab Codes |
| SP-1 | 8711-14 | 1300.0000 | R | 1475.0000 | | 1.1300 | | .0100 | | .0230 | D | .0350 | |
| SP-1(REP) | 8711-25 | 992.0000 | R | 1338.0000 | | .9010 | | .0100 | | .0150 | D | .0300 | |
| ZP-1 | 8711-63 | 14.3000 | S | .0000 | M | .1190 | | .0000 | M | .0533 | | .0000 | M |
| LL-1 | 8711-51 | 15.4000 | S | .0000 | M | 2.7600 | | .0000 | M | .0090 | U | .0000 | M |
| LL-2 | 8711-52 | 17.4000 | S | .0000 | M | .1620 | | .0000 | M | .0150 | D | .0000 | M |
| LL-2(REP) | 8711-64 | 16.1000 | S | .0000 | M | .1710 | | .0000 | M | .0133 | D | .0000 | M |
| AP-1 | 8711-55 | .3540 | S | .0000 | M | .1530 | | .0000 | M | .0152 | D | .0000 | M |
| ST-1 | 8711-61 | 14.0000 | | 13.8000 | | 14.9000 | | 14.3000 | | .0110 | D | .0230 | |
| TT-1 | 8711-53 | 22.0000 | | 23.3000 | | .0050 | U | .0030 | | .0090 | U | .0100 | |
| S-1 | 8711-58 | 34.3000 | S | 35.0000 | | .1280 | | .1350 | | .0090 | U | .0100 | |
| S-2 | 8711-59 | 19.5000 | | .0000 | M | .1730 | | .0000 | M | .0114 | D | .0000 | M |
| S-2(REP) | 8711-65 | 19.4000 | | .0000 | M | .1790 | | .0000 | M | .0104 | D | .0000 | M |
| S-3 | 8711-60 | 37.0000 | | .0000 | M | .0200 | U | .0000 | M | .0360 | U | .0000 | M |
| AP-2 | 8711-56 | 2970.0000 | | 2667.0000 | | 118.0000 | | 123.0000 | | .3600 | U | .0170 | |
| AP-3 | 8711-57 | 18.6000 | | .0000 | M | .1020 | | .0000 | M | .0108 | D | .0000 | M |
| AP-3(REP) | 8711-71 | 18.3000 | S | .0000 | M | .0970 | | .0000 | M | .0115 | D | .0000 | M |
| ST-2 | 8711-62 | 19.0000 | | .0000 | M | .1100 | | .0000 | M | .0112 | D | .0000 | M |
| SP-1 | 8711-54 | 286.0000 | | .0000 | M | .0100 | U | .0000 | M | .0180 | U | .0000 | M |
| BLANK | 8712-26 | .0030 | D | .0190 | | .0030 | U | .0010 | | .0075 | D | .0080 | U |
| AP-2 | 8712-16 | 1920.0000 | | 2200.0000 | | 43.8000 | | 37.5000 | | .0130 | D | .0180 | |
| S-1 | 8712-18 | 17.1000 | | 35.0000 | | .1470 | | .0560 | | .0090 | D | .0090 | |
| S-2 | 8712-19 | 16.8000 | | 19.9000 | | .0810 | | .0340 | | .0240 | D | .0200 | |
| S-2(REP) | 8712-25 | 16.9000 | | 19.3000 | | .0750 | | .0340 | | .0300 | | .0230 | |
| AP-1 | 8712-75 | .1070 | | .1060 | | .0280 | | .0260 | | .0130 | D | .0080 | |
| ST-2 | 8712-82 | 85.8000 | | 90.6000 | | 4.8100 | | 4.8800 | | .0250 | | .0210 | |
| ST-2(REP) | 8712-84 | 81.3000 | | 83.4000 | | 4.7100 | | 4.7600 | | .0280 | | .0290 | |
| BLANK | 8712-86 | .0030 | D | .0080 | | .0030 | U | .0010 | U | .0072 | D | .0080 | U |

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Table 6. Process water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the dissolved metals Fe, Pb and Zn. The full data set is shown.

| Site ID | Sample Number | CLP | | ASRCO | | CLP | | ASRCO | | CLP | | ASRCO | |
|--------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|
| | | Fe (mg/l) | Lab Codes | Fe (mg/l) | Lab Codes | Pb (mg/l) | Lab Codes | Pb (mg/l) | Lab Codes | Zn (mg/l) | Lab. Codes | Zn (mg/l) | Lab Codes |
| LL-1 | 8705-133 | .100 | U | .135 | | .0530 | S | .1310 | | .115 | | .221 | |
| AP-2 | 8705-6 | 22.800 | | 20.000 | | 8.1100 | | 8.0000 | | 52.000 | | 51.700 | |
| S-2 | 8705-9 | .100 | U | .033 | | .0870 | | .0280 | | .040 | | .033 | |
| S-1 | 8705-10 | .100 | U | .026 | | .0550 | | .0080 | | .065 | | .054 | |
| LL-2(REP) | 8705-132 | .100 | U | .028 | | .0064 | | .0070 | | .090 | | .076 | |
| LL-2 | 8705-131 | .100 | U | .033 | | .0180 | S | .0070 | | .107 | | .085 | |
| ST-1 | 8705-12 | .100 | U | .056 | | .0330 | S | .0080 | | 2.920 | | 2.890 | |
| SPEISS PIT | 8705-8 | .253 | | 1.360 | | .0300 | U | .0760 | | .020 | U | .107 | |
| SP-1 | 8705-7 | .166 | | 1.330 | | .0300 | U | .0610 | | .114 | | .173 | |
| TRCK WSH SMP | 8705-11 | .100 | U | .070 | | 1.4500 | | 1.3300 | | 327.000 | | 290.000 | |
| LOWER LAKE | 8612-12 | .191 | * | .075 | | .0232 | K | .0220 | | 1.760 | * | 1.500 | |
| BLANK | 8612-15 | .040 | D | .025 | | .0030 | U* | .0050 | U | .153 | K | .014 | |
| S-2 | 8612-20 | .096 | * | .038 | | .0046 | K | .0050 | | 4.660 | K | 5.000 | |
| SCRUB FLUID | 8612-21 | 10.400 | * | 8.300 | | 9.3900 | * | 19.0000 | | 129.000 | * | 145.000 | |
| SP-1 | 8612-22 | .108 | * | .050 | | .0030 | U* | .0080 | UN | .186 | K | .017 | |
| S-3 | 8710-100 | .015 | D | .120 | | .0100 | # | .0180 | | .018 | L | .017 | |
| BLANK | 8710-16 | .006 | D | .020 | | .0060 | L | .0050 | U | .007 | * | .008 | U |
| TT-1 | 8710-3 | .803 | | .725 | | 2.3200 | L | 1.5000 | | 2.230 | L | 2.400 | |
| AP-1 | 8710-5 | .060 | D | .071 | | .0190 | L | .0062 | | .057 | L | .064 | |
| AP-2 | 8710-6 | 40.300 | | 41.700 | | 25.5000 | L | 25.0000 | | 58.400 | L | 55.700 | |
| AP-3 | 8710-11 | .036 | D | .060 | | .0330 | L | .0450 | | 1.390 | L | 1.280 | |
| BLANK | 8710-17 | .008 | D | .020 | U | .1870 | L | .2130 | | .005 | * | .008 | U |
| ZP-1 | 8710-13 | .033 | D | .054 | | .0480 | L | .0260 | | .323 | L | .289 | |
| ST-2 | 8710-10 | 1.310 | | .693 | | .0510 | L | .0400 | | 4.770 | L | 4.280 | |
| BLANK | 8711-26 | .006 | D | .020 | | .0040 | D | .0050 | U | .006 | D | .008 | U |
| LL-1 | 8711-11 | .459 | | .323 | | .0040 | D | .0050 | | 7.600 | | 8.130 | |
| LL-2 | 8711-12 | .014 | D | .035 | | .0030 | D | .0053 | | .295 | | .270 | |
| ST-1 | 8711-21 | .040 | D | .056 | | .0280 | | .1300 | | 2.560 | | 2.380 | |
| BLANK | 8711-27 | .006 | D | .020 | U | .0060 | | .0050 | U | .009 | D | .008 | U |

0080212

Table 6. Continued.

| Site ID | Sample Number | CLP | | ASRCO | | CLP | | ASRCO | | CLP | | ASRCO | |
|-----------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|
| | | Fe (mg/l) | Lab Codes | Fe (mg/l) | Lab Codes | Pb (mg/l) | Lab Codes | Pb (mg/l) | Lab Codes | Zn (mg/l) | Lab. Codes | Zn (mg/l) | Lab Codes |
| SP-1 | 8711-14 | .004 | U | .715 | | .0200 | U | .0220 | | .016 | D | .015 | |
| SP-1(REP) | 8711-25 | .004 | U | .730 | | .0020 | U | .0195 | | .013 | D | .020 | |
| ZP-1 | 8711-63 | .031 | U | .000 | M | .0100 | UN | .0000 | M | .856 | E | .000 | M |
| LL-1 | 8711-51 | 1.500 | | .000 | M | .0100 | UN | .0000 | M | 14.000 | E | .000 | M |
| LL-2 | 8711-52 | .031 | U | .000 | M | .0100 | UN | .0000 | M | .195 | E | .000 | M |
| LL-2(REP) | 8711-64 | .031 | U | .000 | M | .0100 | UN | .0000 | M | .187 | | .000 | M |
| AP-1 | 8711-55 | .083 | D | .000 | M | .0966 | S | .0000 | M | .291 | E | .000 | M |
| ST-1 | 8711-61 | 4.120 | | 2.080 | | .0100 | UN | .0125 | U | 69.600 | E | 68.000 | |
| TT-1 | 8711-53 | .031 | U | .038 | | .0010 | UN | .0125 | U | .013 | UE | .008 | U |
| S-1 | 8711-58 | 3.760 | | 1.810 | | .0107 | S | .0086 | | 1.180 | E | 1.080 | |
| S-2 | 8711-59 | .100 | | .000 | M | .0231 | S | .0000 | M | .305 | E | .000 | M |
| S-2(REP) | 8711-65 | .077 | D | .000 | M | .0355 | | .0000 | M | .302 | | .000 | M |
| S-3 | 8711-60 | .124 | U | .000 | M | .0100 | UE | .0000 | M | .052 | UE | .000 | M |
| AP-2 | 8711-56 | 25.200 | | 18.700 | | 23.1000 | | 21.5000 | | 22.200 | E | 21.700 | |
| AP-3 | 8711-57 | .031 | U | .000 | M | .0100 | UN | .0000 | M | .142 | | .000 | M |
| AP-3(REP) | 8711-71 | .031 | U | .000 | M | .0100 | UN | .0000 | M | .138 | E | .000 | M |
| ST-2 | 8711-62 | .031 | U | .000 | M | .0100 | UN | .0000 | M | .154 | E | .000 | M |
| SP-1 | 8711-54 | .062 | U | .000 | M | .0100 | UE | .0000 | M | .026 | UE | .000 | M |
| BLANK | 8712-26 | .004 | D | .021 | | .0020 | U | .0050 | U | .005 | D | .008 | U |
| AP-2 | 8712-16 | 39.600 | | 29.300 | | 11.4000 | | 10.0000 | | 7.520 | | 7.150 | |
| S-1 | 8712-18 | 3.580 | | 1.930 | | .0180 | | .0100 | | .883 | | .906 | |
| S-2 | 8712-19 | .016 | D | .063 | | .0260 | | .0180 | | .042 | | .048 | |
| S-2(REP) | 8712-25 | .030 | D | .055 | | .0320 | | .0240 | | .043 | | .034 | |
| AP-1 | 8712-75 | .093 | D | .090 | | .0350 | | .0200 | | .080 | | .065 | |
| ST-2 | 8712-82 | .130 | | .094 | | .0460 | | .0390 | | 1.870 | | 1.650 | |
| ST-2(REP) | 8712-84 | .144 | | .125 | | .0740 | | .0350 | | 6.050 | | 5.430 | |
| BLANK | 8712-86 | .004 | U | .020 | U | .0110 | | .0050 | U | .009 | | .008 | U |

0080213

0080214

**Process Water
Dissolved Metals
East Helena Smelter Site**

**Samples Used In The Paired T-Test and
Linear Regression Analysis**

Table 7. Process water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the dissolved metals As, Cd and Cu. Only samples used in the paired t-test analysis are shown.

| Site ID | Sample Number | CLP As (mg/l) | CLP Lab Codes | ASRCO As (mg/l) | ASRCO Lab | CLP Cd (mg/l) | CLP Lab | ASRCO Cd (mg/l) | ASRCO Lab | CLP Cu (mg/l) | CLP Lab. | ASRCO Cu (mg/l) | ASRCO Lab |
|--------------|---------------|---------------|---------------|-----------------|-----------|---------------|---------|-----------------|-----------|---------------|----------|-----------------|-----------|
| LL-1 | 8705-133 | 15.3000 | 0 | 16.3000 | | .0510 | | .1840 | | .0230 | D | .1390 | |
| AP-2 | 8705-6 | 2590.0000 | 0 | 2867.0000 | | 147.0000 | | 153.0000 | | .1100 | | .0770 | |
| S-2 | 8705-9 | 17.5000 | 0 | 16.9000 | | .0080 | | .0140 | | .0330 | | .0110 | |
| S-1 | 8705-10 | 15.2000 | 0 | 15.0000 | | .0420 | | .0450 | | .0360 | | .0190 | |
| LL-2(REP) | 8705-132 | 15.2000 | 0 | 15.0000 | | .0410 | | .0490 | | .0310 | | .0210 | |
| LL-2 | 8705-131 | 14.8000 | 0 | 15.3100 | | .0440 | | .0490 | | .0380 | | .0200 | |
| ST-1 | 8705-12 | 17.0000 | 0 | 16.5600 | | .8150 | | .7130 | | .0490 | | .0210 | |
| SPEISS PIT | 8705-8 | 3650.0000 | 0 | 3733.0000 | | | | | | | | | |
| SP-1 | 8705-7 | 3330.0000 | 0 | 3733.0000 | | | | | | | | .0280 | |
| TRCK WSH SMP | 8705-11 | .3260 | A | .5100 | | 90.7000 | | 93.5000 | | .0600 | | .0700 | |
| LOWER LAKE | 8612-12 | 18.3000 | * | 20.0000 | | .6330 | * | .7500 | | .0440 | * | .0280 | |
| BLANK | 8612-15 | | | | | | | | | | | | |
| S-2 | 8612-20 | 14.0000 | * | 15.0000 | | 1.4700 | * | 1.6880 | | .0420 | * | .0230 | |
| SCRUB FLUID | 8612-21 | 2400.0000 | * | 2750.0000 | | 407.0000 | * | 550.0000 | | .0300 | * | .0130 | |
| SP-1 | 8612-22 | 55.9000 | * | 55.0000 | | | | | | | | .0310 | * |
| S-3 | 8710-100 | 84.0000 | | 68.5000 | | .1360 | N | .0250 | | 1.2800 | | .9270 | |
| BLANK | 8710-16 | | | | | | | | | | | | |
| TT-1 | 8710-3 | 16.4000 | | 20.1000 | | .6550 | N | .6840 | | .1790 | | .1890 | |
| AP-1 | 8710-5 | .0680 | | .0350 | | .0090 | N | .0113 | | .0170 | D | .0360 | |
| AP-2 | 8710-6 | 1820.0000 | | 1803.0000 | | 229.0000 | N | 235.0000 | | .0140 | D | .0500 | |
| AP-3 | 8710-11 | 15.1000 | | 16.8000 | | .4510 | N | .4060 | | .0250 | D | .0240 | |
| BLANK | 8710-17 | .0040 | D | .0140 | | | | | | | | | |
| ZP-1 | 8710-13 | 11.4000 | | 13.1300 | | .0720 | N | .0575 | | .0520 | | .0410 | |
| ST-2 | 8710-10 | 97.0000 | | 102.0000 | | 9.9500 | N | 9.6300 | | .0340 | | .0310 | |
| BLANK | 8711-26 | | | | | .0010 | D | .0010 | | | | | |
| LL-1 | 8711-11 | | | | | 2.4100 | | 2.2500 | | .0120 | D | .0130 | |
| LL-2 | 8711-12 | | | | | .4760 | | .4410 | | .0180 | D | .0200 | |
| ST-1 | 8711-21 | | | | | .7240 | | .7100 | | .0190 | D | .0190 | |
| BLANK | 8711-27 | | | | | | | | | | | | |

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Table 7. Continued.

| Site ID | Sample Number | CLP As (mg/l) | CLP Lab Codes | ASRCO As (mg/l) | ASRCO Lab Codes | CLP Cd (mg/l) | CLP Lab Codes | ASRCO Cd (mg/l) | ASRCO Lab Codes | CLP Cu (mg/l) | CLP Lab. Codes | ASRCO Cu (mg/l) | ASRCO Lab Codes |
|------------|------------------|---------------------|---------------------|-----------------------|-----------------------|---------------------|---------------------|-----------------------|-----------------------|---------------------|----------------------|-----------------------|-----------------------|
| SP-1 | 8711-14 | | | | | 1.1300 | | .0100 | | .0230 | D | .0350 | |
| SP-1(REP) | 8711-25 | | | | | .9010 | | .0100 | | .0150 | D | .0300 | |
| ZP-1 | 8711-63 | | | | | | | | | | | | |
| LL-1 | 8711-51 | | | | | | | | | | | | |
| LL-2 | 8711-52 | | | | | | | | | | | | |
| LL-2(REP) | 8711-64 | | | | | | | | | | | | |
| AP-1 | 8711-55 | | | | | | | | | | | | |
| ST-1 | 8711-61 | 14.0000 | | 13.8000 | | 14.9000 | | 14.3000 | | .0110 | D | .0230 | |
| TT-1 | 8711-53 | 22.0000 | | 23.3000 | | | | | | | | | |
| S-1 | 8711-58 | 34.3000 | S | 35.0000 | | .1280 | | .1350 | | | | | |
| S-2 | 8711-59 | | | | | | | | | | | | |
| S-2(REP) | 8711-65 | | | | | | | | | | | | |
| S-3 | 8711-60 | | | | | | | | | | | | |
| AP-2 | 8711-56 | 2970.0000 | | 2667.0000 | | 118.0000 | | 123.0000 | | | | | |
| AP-3 | 8711-57 | | | | | | | | | | | | |
| AP-3(REP) | 8711-71 | | | | | | | | | | | | |
| ST-2 | 8711-62 | | | | | | | | | | | | |
| SP-1 | 8711-54 | | | | | | | | | | | | |
| BLANK | 8712-26 | .0030 | D | .0190 | | | | | | | | | |
| AP-2 | 8712-16 | 1920.0000 | | 2200.0000 | | 43.8000 | | 37.5000 | | .0130 | D | .0180 | |
| S-1 | 8712-18 | 17.1000 | | 35.0000 | | .1470 | | .0560 | | .0090 | D | .0090 | |
| S-2 | 8712-19 | 16.8000 | | 19.9000 | | .0810 | | .0340 | | .0240 | D | .0200 | |
| S-2(REP) | 8712-25 | 16.9000 | | 19.3000 | | .0750 | | .0340 | | .0300 | | .0230 | |
| AP-1 | 8712-75 | .1070 | | .1060 | | .0280 | | .0260 | | .0130 | D | .0080 | |
| ST-2 | 8712-82 | 85.8000 | | 90.6000 | | 4.8100 | | 4.8800 | | .0250 | | .0210 | |
| ST-2(REP) | 8712-84 | 81.3000 | | 83.4000 | | 4.7100 | | 4.7600 | | .0280 | | .0290 | |
| BLANK | 8712-86 | .0030 | D | .0080 | | | | | | | | | |

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Table 8. Process water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the dissolved metals Fe, Pb and Zn. Only samples used in the paired t-test analysis are shown.

| Site ID | Sample Number | CLP Fe (mg/l) | CLP Lab Codes | ASRCO Fe (mg/l) | ASRCO Lab Codes | CLP Pb (mg/l) | CLP Lab | ASRCO Pb (mg/l) | ASRCO Lab | CLP Zn (mg/l) | CLP Lab. | ASRCO Zn (mg/l) | ASRCO Lab |
|--------------|---------------|---------------|---------------|-----------------|-----------------|---------------|---------|-----------------|-----------|---------------|----------|-----------------|-----------|
| LL-1 | 8705-133 | | | | | .0530 | S | .1310 | | .115 | | .221 | |
| AP-2 | 8705-6 | 22.800 | | 20.000 | | 8.1100 | | 8.0000 | | 52.000 | | 51.700 | |
| S-2 | 8705-9 | | | | | .0870 | | .0280 | | .040 | | .033 | |
| S-1 | 8705-10 | | | | | .0550 | | .0080 | | .065 | | .054 | |
| LL-2(REP) | 8705-132 | | | | | .0064 | | .0070 | | .090 | | .076 | |
| LL-2 | 8705-131 | | | | | .0180 | S | .0070 | | .107 | | .085 | |
| ST-1 | 8705-12 | | | | | .0330 | S | .0080 | | 2.920 | | 2.890 | |
| SPEISS PIT | 8705-8 | .253 | | 1.360 | | | | | | | | | |
| SP-1 | 8705-7 | .166 | | 1.330 | | | | | | .114 | | .173 | |
| TRCK WSH SMP | 8705-11 | | | | | 1.4500 | | 1.3300 | | 327.000 | | 290.000 | |
| LOWER LAKE | 8612-12 | .191 | * | .075 | | .0232 | K | .0220 | | 1.760 | * | 1.500 | |
| BLANK | 8612-15 | .040 | D | .025 | | | | | | .153 | K | .014 | |
| S-2 | 8612-20 | .096 | * | .038 | | .0046 | K | .0050 | | 4.660 | K | 5.000 | |
| SCRUB FLUID | 8612-21 | 10.400 | * | 8.300 | | 9.3900 | * | 19.0000 | | 129.000 | * | 145.000 | |
| SP-1 | 8612-22 | .108 | * | .050 | | | | | | .186 | K | .017 | |
| S-3 | 8710-100 | .015 | D | .120 | | .0100 | # | .0180 | | .018 | L | .017 | |
| BLANK | 8710-16 | .006 | D | .020 | | | | | | | | | |
| TT-1 | 8710-3 | .803 | | .725 | | 2.3200 | L | 1.5000 | | 2.230 | L | 2.400 | |
| AP-1 | 8710-5 | .060 | D | .071 | | .0190 | L | .0062 | | .057 | L | .064 | |
| AP-2 | 8710-6 | 40.300 | | 41.700 | | 25.5000 | L | 25.0000 | | 58.400 | L | 55.700 | |
| AP-3 | 8710-11 | .036 | D | .060 | | .0330 | L | .0450 | | 1.390 | L | 1.280 | |
| BLANK | 8710-17 | | | | | .1870 | L | .2130 | | | | | |
| ZP-1 | 8710-13 | .033 | D | .054 | | .0480 | L | .0260 | | .323 | L | .289 | |
| ST-2 | 8710-10 | 1.310 | | .693 | | .0510 | L | .0400 | | 4.770 | L | 4.280 | |
| BLANK | 8711-26 | .006 | D | .020 | | | | | | | | | |
| LL-1 | 8711-11 | .459 | | .323 | | .0040 | D | .0050 | | 7.600 | | 8.130 | |
| LL-2 | 8711-12 | .014 | D | .035 | | .0030 | D | .0053 | | .295 | | .270 | |
| ST-1 | 8711-21 | .040 | D | .056 | | .0280 | | .1300 | | 2.560 | | 2.380 | |

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Table 8. Continued.

| Site ID | Sample Number | CLP Fe (mg/l) | CLP Lab Codes | ASRCO Fe (mg/l) | ASRCO Lab Codes | CLP Pb (mg/l) | CLP Lab Codes | ASRCO Pb (mg/l) | ASRCO Lab Codes | CLP Zn (mg/l) | CLP Lab. Codes | ASRCO Zn (mg/l) | ASRCO Lab Codes |
|------------|------------------|---------------------|---------------------|-----------------------|-----------------------|---------------------|---------------------|-----------------------|-----------------------|---------------------|----------------------|-----------------------|-----------------------|
| BLANK | 8711-27 | | | | | | | | | | | | |
| SP-1 | 8711-14 | | | | | | | | | .016 | D | .015 | |
| SP-1(REP) | 8711-25 | | | | | | | | | .013 | D | .020 | |
| ZP-1 | 8711-63 | | | | | | | | | | | | |
| LL-1 | 8711-51 | | | | | | | | | | | | |
| LL-2 | 8711-52 | | | | | | | | | | | | |
| LL-2(REP) | 8711-64 | | | | | | | | | | | | |
| AP-1 | 8711-55 | | | | | | | | | | | | |
| ST-1 | 8711-61 | 4.120 | | 2.080 | | | | | | 69.600 | E | 68.000 | |
| TT-1 | 8711-53 | | | | | | | | | | | | |
| S-1 | 8711-58 | 3.760 | | 1.810 | | .0107 | S | .0086 | | 1.180 | E | 1.080 | |
| S-2 | 8711-59 | | | | | | | | | | | | |
| S-2(REP) | 8711-65 | | | | | | | | | | | | |
| S-3 | 8711-60 | | | | | | | | | | | | |
| AP-2 | 8711-56 | 25.200 | | 18.700 | | 23.1000 | | 21.5000 | | 22.200 | E | 21.700 | |
| AP-3 | 8711-57 | | | | | | | | | | | | |
| AP-3(REP) | 8711-71 | | | | | | | | | | | | |
| ST-2 | 8711-62 | | | | | | | | | | | | |
| SP-1 | 8711-54 | | | | | | | | | | | | |
| BLANK | 8712-26 | .004 | D | .021 | | | | | | | | | |
| AP-2 | 8712-16 | 39.600 | | 29.300 | | 11.4000 | | 10.0000 | | 7.520 | | 7.150 | |
| S-1 | 8712-18 | 3.580 | | 1.930 | | .0180 | | .0100 | | .883 | | .906 | |
| S-2 | 8712-19 | .016 | D | .063 | | .0260 | | .0180 | | .042 | | .048 | |
| S-2(REP) | 8712-25 | .030 | D | .055 | | .0320 | | .0240 | | .043 | | .034 | |
| AP-1 | 8712-75 | .093 | D | .090 | | .0350 | | .0200 | | .080 | | .065 | |
| ST-2 | 8712-82 | .130 | | .094 | | .0460 | | .0390 | | 1.870 | | 1.650 | |
| ST-2(REP) | 8712-84 | .144 | | .125 | | .0740 | | .0350 | | 6.050 | | 5.430 | |
| BLANK | 8712-86 | | | | | | | | | | | | |

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0080219

**Soil Core Data
East Helena Smelter Site**

Full Data Base

Table 1. Soil core data collected from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) an ASRCO for the parameters As, Cd and Cu. The full data base is shown.

| Sample ID | CLP As (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO As (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Cd (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Cd (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Cu (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Cu (mg/kg) | ASRCO Lab Codes | ASRCO Rev. |
|-----------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|
| DH-1-1 | 108.00 | N | J | 66.00 | | | 60.00 | N | J | 13.00 | | | 288.00 | R | | 95.00 | | |
| DH-1-2 | 95.00 | | | 107.00 | | | 48.00 | | | 44.00 | | | 324.00 | | | 280.00 | | |
| DH-1-5 | 26.00 | | | 23.00 | | | 1.90 | | | 2.80 | | | 21.00 | | | 23.00 | | |
| DH-1-7 | 26.00 | | | 47.00 | | | 1.40 | | | 0.90 | | | 25.00 | | | 29.00 | | |
| DH-10-1 | 50.00 | N | | 119.00 | | | 12.00 | | | 19.00 | | | 830.00 | | | 148.00 | | |
| DH-10-4 | 22.00 | N | | 27.00 | | | 1.60 | | | 2.10 | | | 81.00 | | | 88.00 | | |
| DH-10-7 | 1010.00 | N | | 859.00 | | | 197.00 | | | 127.00 | | | 1650.00 | | | 593.00 | | |
| DH-13-1 | 4120.00 | N | J | 3163.00 | | | 1410.00 | N | J | 1610.00 | | | 17100.00 | R | | 17125.00 | | |
| DH-13-3 | 32.00 | | | 28.00 | | | 1.50 | | | 2.10 | | | 86.00 | | | 88.00 | | |
| DH-13-4 | 15.00 | | | 28.00 | | | 5.40 | | | 2.20 | | | 184.00 | | | 91.00 | | |
| DH-13-7 | 31.00 | N | | 27.00 | | | 1.20 | | | 0.60 | | | 30.00 | | | 31.00 | | |
| DH-17-1 | 2740.00 | | | 2513.00 | | | 244.00 | | | 202.00 | | | 1450.00 | | | 1403.00 | | |
| DH-17-5 | 16.00 | | | 18.00 | | | 1.00 | U | U | 0.53 | | | 15.00 | | | 12.00 | | |
| DH-17-7 | 11.00 | | | 3.80 | | | 1.00 | U | U | 0.50 | U | U | 17.00 | | | 18.00 | | |
| DH-19-5 | 4740.00 | | | 12000.00 | | | 239.00 | | | 425.00 | | | 205.00 | | | 265.00 | | |
| DH-19-8 | 354.00 | | | 225.00 | | | 145.00 | | | 230.00 | | | 228.00 | | | 245.00 | | |
| DH-2-1 | 80.00 | N | | 138.00 | | | 76.00 | | | 141.00 | | | 203.00 | | | 280.00 | | |
| DH-2-4 | 15.00 | | | 23.00 | | | 1.00 | U | U | 0.60 | | | 20.00 | | | 25.00 | | |
| DH-20-9 | 15.00 | | | 24.00 | | | 1.00 | U | U | 4.50 | | | 46.00 | | | 71.00 | | |
| DH-21-3 | 418.00 | | | 325.00 | | | 1.90 | | | 4.50 | | | 78.00 | | | 340.00 | | |
| DH-21-9 | 301.00 | | | 550.00 | | | 1.50 | | | 1.00 | | | 56.00 | | | 37.00 | | |
| DH-22-11 | 385.00 | | | 18.00 | | | 37.00 | | | 2.00 | | | 79.00 | | | 13.00 | | |
| DH-22-6 | 5.50 | | | 11.00 | | | 1.00 | U | U | 1.50 | | | 16.00 | | | 31.00 | | |
| DH-23-3 | 175.00 | | | 125.00 | | | 23.00 | | | 23.00 | | | 1630.00 | | | 2350.00 | | |
| DH-23-6 | 721.00 | J | | 700.00 | | | 133.00 | J | | 150.00 | | | 3280.00 | J | | 3100.00 | | |
| DH-24-11 | 148.00 | | | 75.00 | | | 1.30 | U | U | 5.00 | | | 91.00 | | | 68.00 | | |
| DH-24-5 | 5.70 | J | | 16.00 | | | 1.00 | U | UJ | 0.80 | | | 29.00 | J | | 26.00 | | |
| DH-26-3 | 134.00 | J | | 164.00 | | | 2.50 | J | | 2.50 | | | 40.00 | J | | 28.00 | | |
| DH-26-7 | 117.00 | | | 100.00 | | | 1.40 | | | 1.50 | | | 62.00 | | | 90.00 | | |
| DH-27-3 | 79.00 | | | 162.00 | | | 2.30 | | | 2.00 | | | 45.00 | | | 35.00 | | |
| DH-27-7 | 179.00 | | | 174.00 | | | 4.90 | | | 4.50 | | | 45.00 | | | 54.00 | | |

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Table 1. Continued.

| Sample ID | CLP As (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO As (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Cd (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Cd (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Cu (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Cu (mg/kg) | ASRCO Lab Codes | ASRCO Rev. |
|-----------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|
| DH-28-10 | 530.00 | | | 545.00 | | | 318.00 | | | 352.00 | | | 46.00 | | | 51.00 | | |
| DH-28-11 | 2.90 | U | U | 32.00 | | | 1.50 | U | U | 9.80 | | | 53.00 | | | 18.00 | | |
| DH-28-3 | 120.00 | | J | 79.00 | | | 3.70 | | | 1.10 | | | 36.00 | | | 27.00 | | |
| DH-29-4 | 263.00 | | | 305.00 | | | 44.00 | | | 58.00 | | | 485.00 | | | 650.00 | | |
| DH-29-6 | 215.00 | N | J | 342.00 | | | 28.00 | N | J | 27.00 | | | 699.00 | | R | 1058.00 | | |
| DH-3-1 | 97.00 | | | 102.00 | | | 62.00 | | | 34.00 | | | 89.00 | | | 83.00 | | |
| DH-3-4 | 11.00 | N | | 13.00 | | | 1.10 | U | U | 0.50 | U | U | 19.00 | | | 18.00 | | |
| DH-3-7 | 10.00 | N | | 13.00 | | | 1.20 | U | U | 0.68 | | | 20.00 | | | 17.00 | | |
| DH-6-1 | 83.00 | N | | 129.00 | | | 28.00 | | | 36.00 | | | 5560.00 | | | 17425.00 | | |
| DH-6-5 | 63.30 | N | | 54.00 | | | 11.00 | | | 7.50 | | | 1180.00 | | | 1153.00 | | |
| DH-6-7 | 7.80 | N | | 9.50 | | | 1.20 | U | U | 1.20 | | | 54.00 | | | 41.00 | | |
| DH-7-1 | 59.00 | | | 99.00 | | | 17.00 | | | 17.00 | | | 229.00 | | | 288.00 | | |
| DH-7-5 | 45.00 | | | 54.00 | | | 7.30 | | | 12.00 | | | 64.00 | | | 45.00 | | |
| DH-7-6 | 38.00 | N | J | 11.00 | | | 7.40 | N | J | 0.50 | U | U | 47.00 | | R | 25.00 | | |
| DH-7-7 | 7.70 | N | | 13.00 | | | 1.00 | U | U | 0.50 | U | U | 23.00 | | | 24.00 | | |
| EH-57-11 | 7.00 | N | J | 11.00 | | | 6.70 | N | J | 2.50 | | | 105.00 | | R | 37.00 | | |
| EH-59-2 | 7.00 | N | J | 13.00 | | | 0.60 | UN | UR | 2.00 | | | 32.00 | | R | 46.00 | | |
| EH-59-5 | 9.80 | | | 18.00 | | | 21.00 | | | 1.50 | | | 50.00 | | | 44.00 | | |
| EH-61-5 | 11.00 | | | 10.00 | | | 1.10 | U | U | 0.50 | U | U | 48.00 | | | 50.00 | | |
| LH-1-1 | 2660.00 | | | 3050.00 | | | 102.00 | | | 430.00 | | | 483.00 | | | 1600.00 | | |
| LH-1-4 | 81.00 | | | 112.00 | | | 11.00 | | | 3.00 | | | 66.00 | | | 50.00 | | |
| LH-1-6 | 70.00 | | | 10.00 | | | 56.00 | | | 0.50 | U | U | 29.00 | | | 10.00 | | |
| LH-2-1 | 4500.00 | | | 1200.00 | | | 965.00 | | | 246.00 | | | 2270.00 | | | 1550.00 | | |
| LH-2-5 | 81.00 | | | 225.00 | | | 7.30 | | | 18.00 | | | 169.00 | | | 195.00 | | |
| LH-2-8 | 11.00 | N | J | 18.00 | | | 0.82 | UN | UR | 2.50 | | | 11.00 | | R | 41.00 | | |
| LH-3-1 | 1650.00 | N | J | 570.00 | | | 245.00 | N | J | 66.00 | | | 1050.00 | | R | 320.00 | | |
| LH-3-5 | 25.00 | | | 15.00 | | | 2.40 | | | 1.00 | | | 70.00 | | | 51.00 | | |
| LH-3-7 | 4.40 | | | 23.00 | | | 1.10 | U | U | 1.50 | | | 13.00 | | | 58.00 | | |
| LH-4-1 | 5150.00 | N | J | 1900.00 | | | 868.00 | N | J | 220.00 | | | 2410.00 | | R | 900.00 | | |
| LH-4-5 | 544.00 | | | 550.00 | | | 24.00 | | | 41.00 | | | 324.00 | | | 500.00 | | |
| LH-4-9 | 4.30 | | | 15.00 | | | 1.00 | U | U | 0.50 | U | U | 10.00 | | | 21.00 | | |
| LH-5-1 | 47600.00 | N | J | 22500.00 | | | 9100.00 | N | J | 9500.00 | | | 21000.00 | | R | 10700.00 | | |

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Table 1. Continued.

| Sample ID | CLP As (mg/kg) | CLP Lab Codes | CLP Rev. Codes | ASRCO As (mg/kg) | ASRCO Lab Codes | ASRCO Rev. Codes | CLP Cd (mg/kg) | CLP Lab Codes | CLP Rev. Codes | ASRCO Cd (mg/kg) | ASRCO Lab Codes | ASRCO Rev. Codes | CLP Cu (mg/kg) | CLP Lab Codes | CLP Rev. Codes | ASRCO Cu (mg/kg) | ASRCO Lab Codes | ASRCO Rev. Codes |
|-----------|-------------------|------------------|-------------------|---------------------|--------------------|---------------------|-------------------|------------------|-------------------|---------------------|--------------------|---------------------|-------------------|------------------|-------------------|---------------------|--------------------|---------------------|
| LH-5-5 | 33.00 | N | | 33.00 | | | 1.30 | U | U | 0.50 | U | U | 100.00 | | | 75.00 | | |
| LH-5-7 | 4.50 | | | 5.00 | | | 1.10 | U | U | 0.50 | U | U | 10.00 | | | 7.00 | | |
| LH-6-1 | 3410.00 | N | J | 5800.00 | | | 252.00 | | | 455.00 | | | 1340.00 | | | 1690.00 | | |
| LH-6-3 | 136.00 | N | J | 65.00 | | | 50.00 | N | J | 9.00 | | | 278.00 | R | | 83.00 | | |
| LH-6-6 | 13.00 | | | 12.00 | | | 1.10 | U | U | 0.50 | U | U | 17.00 | | | 22.00 | | |
| SC-3-10 | 2.80 | UN | U | 14.00 | | | 1.40 | U | U | 7.00 | | | 14.00 | | | 15.00 | | |
| SC-3-2 | 14.00 | N | | 17.00 | | | 1.20 | U | U | 3.80 | | | 30.00 | | | 25.00 | | |
| SC-3-6 | 17.00 | | | 357.00 | | | 1.10 | | | 307.00 | | | 19.00 | | | 38.00 | | |
| SC-4-1 | 1940.00 | N | | 1273.00 | | | 201.00 | | | 110.00 | | | 20800.00 | | | 14500.00 | | |
| SC-4-3 | 34.00 | N | | 36.00 | | | 3.90 | | | 13.00 | | | 244.00 | | | 102.00 | | |
| SC-5-4 | 518.00 | N | J | 475.00 | | | 156.00 | N | J | 94.00 | | | 92.00 | R | | 58.00 | | |
| SC-5-7 | 23.00 | | | 24.00 | | | 5.80 | | | 6.80 | | | 26.00 | | | 39.00 | | |
| TH-2-4 | 19.00 | N | J | 22.00 | | | 2.70 | N | J | 3.40 | | | 28.00 | R | | 31.00 | | |
| TH-2-7 | 91.00 | N | J | 164.00 | | | 2.40 | N | J | 3.00 | | | 34.00 | R | | 46.00 | | |
| WD-2-4 | 164.00 | N | J | 140.00 | | | 61.00 | N | J | 37.00 | | | 69.00 | R | | 46.00 | | |
| WD-2-5 | 103.00 | | J | 74.00 | | | 20.00 | | | 48.00 | | | 43.00 | | | 43.00 | | |
| WD-3-2 | 79.00 | | | 104.00 | | | 175.00 | | | 126.00 | | | 103.00 | J | | 41.00 | | |
| WD-5-1 | 58.00 | | | 169.00 | | | 62.00 | | | 68.00 | | | 71.00 | | | 87.00 | | |
| WD-5-4 | 22.00 | | | 32.00 | | | 4.40 | | | 2.80 | | | 29.00 | | | 27.00 | | |

Lab and Reviewer Codes: N = Spike recovery not within control limit, J = Value is an estimate, U = Actual value "less than" reported value,
R = Data unusable.

Table 2. Soil core data collected from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) an ASRCO for the parameters Pb, Hg and Zn. The full data base is shown.

| Sample ID | CLP Pb (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Pb (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Hg (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Hg (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Zn (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Zn (mg/kg) | ASRCO Lab Codes | ASRCO Rev. |
|-----------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|
| DH-1-1 | 1840.00 | | | 373.00 | | | 5.00 | N | J | 0.00 | M | | 1250.00 | N | J | 285.00 | | |
| DH-1-2 | 1380.00 | | | 1655.00 | | | 3.40 | | J | 0.00 | M | | 1180.00 | | | 1081.00 | | |
| DH-1-5 | 64.00 | | | 117.00 | | | 0.21 | | J | 0.00 | M | | 68.00 | | | 86.00 | | |
| DH-1-7 | 36.00 | | | 35.00 | | | 0.12 | U | U | 0.00 | M | | 45.00 | | | 50.00 | | |
| DH-10-1 | 712.00 | | | 1308.00 | | | 0.40 | N | J | 0.00 | M | | 2760.00 | | | 4333.00 | | |
| DH-10-4 | 230.00 | | | 258.00 | | | 1.70 | N | J | 0.00 | M | | 1270.00 | | | 1188.00 | | |
| DH-10-7 | 6920.00 | | | 7993.00 | | | 33.00 | N | J | 0.00 | M | | 4760.00 | | | 3560.00 | | |
| DH-13-1 | 33400.00 | | | 24200.00 | | | 22.00 | N | J | 0.00 | M | | 14000.00 | N | J | 14450.00 | | |
| DH-13-3 | 213.00 | | | 209.00 | | | 0.11 | U | U | 0.00 | M | | 91.00 | | | 112.00 | | |
| DH-13-4 | 233.00 | | | 127.00 | | | 0.11 | U | U | 0.00 | M | | 294.00 | | | 126.00 | | |
| DH-13-7 | 99.00 | | | 86.00 | | | 0.11 | UN | U | 0.00 | M | | 73.00 | | | 42.00 | | |
| DH-17-1 | 33800.00 | | | 18925.00 | | | 3.30 | | J | 0.00 | M | | 21200.00 | | | 20500.00 | | |
| DH-17-5 | 30.00 | | | 29.00 | | | 0.10 | U | U | 0.00 | M | | 39.00 | | | 44.00 | | |
| DH-17-7 | 16.00 | | | 24.00 | | | 0.10 | U | U | 0.00 | M | | 29.00 | | | 29.00 | | |
| DH-19-5 | 294.00 | | | 800.00 | | | 11.00 | | J | 0.00 | M | | 1220.00 | | | 1200.00 | | |
| DH-19-8 | 164.00 | | | 115.00 | | | 18.00 | | J | 0.00 | M | | 306.00 | | | 315.00 | | |
| DH-2-1 | 2160.00 | | | 4190.00 | | | 14.00 | N | J | 0.00 | M | | 649.00 | | | 1134.00 | | |
| DH-2-4 | 33.00 | | | 55.00 | | | 0.10 | U | U | 0.00 | M | | 53.00 | | | 71.00 | | |
| DH-20-9 | 28.00 | | | 100.00 | | | 0.10 | U | U | 0.00 | M | | 42.00 | | | 135.00 | | |
| DH-21-3 | 36.00 | | | 185.00 | | | 2.20 | | J | 0.00 | M | | 73.00 | | | 115.00 | | |
| DH-21-9 | 29.00 | | | 14.00 | | | 0.10 | U | U | 0.00 | M | | 38.00 | | | 67.00 | | |
| DH-22-11 | 62.00 | | | 69.00 | | | 0.15 | | J | 0.00 | M | | 126.00 | | | 67.00 | | |
| DH-22-6 | 26.00 | | | 27.00 | | | 0.10 | U | U | 0.00 | M | | 24.00 | | | 38.00 | | |
| DH-23-3 | 12800.00 | | | 10750.00 | | | 0.19 | | J | 0.00 | M | | 35000.00 | J | | 3950.00 | | |
| DH-23-6 | 34500.00 | J | | 12750.00 | | | 5.40 | | J | 0.00 | M | | 51700.00 | J | | 44000.00 | | |
| DH-24-11 | 55.00 | | | 135.00 | | | 0.13 | U | U | 0.00 | M | | 179.00 | | | 115.00 | | |
| DH-24-5 | 11.00 | J | | 23.00 | | | 0.10 | U | U | 0.00 | M | | 79.00 | J | | 62.00 | | |
| DH-26-3 | 73.00 | J | | 105.00 | | | 0.23 | | J | 0.00 | M | | 123.00 | J | | 100.00 | | |
| DH-26-7 | 25.00 | | | 42.00 | | | 0.10 | U | U | 0.00 | M | | 41.00 | | | 81.00 | | |
| DH-27-3 | 23.00 | | | 7.00 | | | 0.10 | U | U | 0.00 | M | | 38.00 | | | 38.00 | | |
| DH-27-7 | 26.00 | | | 16.00 | | | 0.10 | U | U | 0.00 | M | | 1260.00 | | | 1500.00 | | |

Table 2. Continued.

| Sample ID | CLP Pb (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Pb (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Hg (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Hg (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Zn (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Zn (mg/kg) | ASRCO Lab Codes | ASRCO Rev. |
|-----------|-------------------|------------------|----------|---------------------|--------------------|------------|-------------------|------------------|----------|---------------------|--------------------|------------|-------------------|------------------|----------|---------------------|--------------------|------------|
| DH-28-10 | 13.00 | | | 18.00 | | | 0.19 | | J | 0.00 | M | | 1310.00 | | | 1225.00 | | |
| DH-28-11 | 46.00 | | | 28.00 | | | 0.14 | U | U | 0.00 | M | | 84.00 | | | 97.00 | | |
| DH-28-3 | 49.00 | | | 22.00 | | | 0.35 | | J | 0.00 | M | | 144.00 | | | 46.00 | | |
| DH-29-4 | 4630.00 | | | 6720.00 | | | 20.00 | | J | 0.00 | M | | 3500.00 | | | 3525.00 | | |
| DH-29-6 | 6330.00 | | | 9523.00 | | | 6.60 | N | J | 0.00 | M | | 6810.00 | N | J | 9350.00 | | |
| DH-3-1 | 1820.00 | | | 1139.00 | | | 14.00 | | J | 0.00 | M | | 360.00 | | | 267.00 | | |
| DH-3-4 | 12.70 | | | 32.00 | | | 0.11 | UN | U | 0.00 | M | | 30.00 | | | 39.00 | | |
| DH-3-7 | 12.00 | | | 22.00 | | | 0.12 | UN | U | 0.00 | M | | 43.00 | | | 37.00 | | |
| DH-6-1 | 1240.00 | | | 1738.00 | | | 1.20 | N | J | 0.00 | M | | 990.00 | | | 16475.00 | | |
| DH-6-5 | 416.00 | | | 270.00 | | | 1.20 | N | J | 0.00 | M | | 499.00 | | | 298.00 | | |
| DH-6-7 | 30.00 | | | 41.00 | | | 0.12 | UN | U | 0.00 | M | | 79.00 | | | 91.00 | | |
| DH-7-1 | 645.00 | | | 889.00 | | | 2.20 | | J | 0.00 | M | | 335.00 | | | 518.00 | | |
| DH-7-5 | 382.00 | | | 302.00 | | | 1.60 | | J | 0.00 | M | | 258.00 | | | 247.00 | | |
| DH-7-6 | 269.00 | | | 30.00 | | | 1.80 | | J | 0.00 | M | | 156.00 | N | J | 42.00 | | |
| DH-7-7 | 23.00 | | | 30.00 | | | 0.11 | N | J | 0.00 | M | | 41.00 | | | 40.00 | | |
| EH-57-11 | 170.00 | | | 25.00 | | | 0.10 | UN | UJ | 0.00 | M | | 88.00 | N | J | 29.00 | | |
| EH-59-2 | 16.00 | J | | 14.00 | | | 0.12 | UN | UJ | 0.00 | M | | 94.00 | N | J | 100.00 | | |
| EH-59-5 | 21.00 | | | 19.00 | | | 0.11 | U | U | 0.00 | M | | 91.00 | | | 81.00 | | |
| EH-61-5 | 19.00 | | | 20.00 | | | 0.11 | U | U | 0.00 | M | | 44.00 | | | 45.00 | | |
| LH-1-1 | 2320.00 | | | 8500.00 | | | 18.00 | | J | 0.00 | M | | 3220.00 | | | 4450.00 | | |
| LH-1-4 | 278.00 | | | 160.00 | | | 0.34 | | J | 0.00 | M | | 327.00 | | | 235.00 | | |
| LH-1-6 | 228.00 | | | 10.00 | | | 0.95 | | J | 0.00 | M | | 94.00 | | | 41.00 | | |
| LH-2-1 | 9580.00 | | | 7500.00 | | | 37.00 | | J | 0.00 | M | | 8540.00 | | | 6500.00 | | |
| LH-2-5 | 377.00 | | | 1400.00 | | | 0.56 | | J | 0.00 | M | | 620.00 | | | 965.00 | | |
| LH-2-8 | 10.00 | J | | 35.00 | | | 0.10 | UN | UJ | 0.00 | M | | 49.00 | N | J | 115.00 | | |
| LH-3-1 | 5690.00 | | | 1550.00 | | | 45.00 | N | J | 0.00 | M | | 7290.00 | N | J | 2450.00 | | |
| LH-3-5 | 113.00 | | | 45.00 | | | 0.20 | | J | 0.00 | M | | 168.00 | | | 130.00 | | |
| LH-3-7 | 7.50 | | | 30.00 | | | 0.11 | U | U | 0.00 | M | | 32.00 | | | 95.00 | | |
| LH-4-1 | 12600.00 | | | 4450.00 | | | 54.00 | N | J | 0.00 | M | | 11700.00 | N | J | 4950.00 | | |
| LH-4-5 | 1630.00 | | | 3450.00 | | | 1.50 | | J | 0.00 | M | | 1730.00 | | | 2400.00 | | |
| LH-4-9 | 8.10 | | | 5.00 | | | 0.10 | U | U | 0.00 | M | | 17.00 | | | 16.00 | | |
| LH-5-1 | 72400.00 | R | | 17000.00 | | | 221.00 | N | J | 0.00 | M | | 52200.00 | N | J | 28500.00 | | |

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Table 2. Continued.

| Sample ID | CLP Pb (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Pb (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Hg (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Hg (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Zn (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Zn (mg/kg) | ASRCO Lab Codes | ASRCO Rev. |
|-----------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|
| LH-5-5 | 50.00 | | | 50.00 | | | 0.13 | UN | U | 0.00 | M | | 170.00 | | | 160.00 | | |
| LH-5-7 | 5.70 | | | 10.00 | | | 0.11 | U | U | 0.00 | M | | 36.00 | | | 19.00 | | |
| LH-6-1 | 6400.00 | | | 9500.00 | | | 30.00 | N | J | 0.00 | M | | 10400.00 | | | 8550.00 | | |
| LH-6-3 | 595.00 | | | 335.00 | | | 0.30 | N | J | 0.00 | M | | 1690.00 | N | J | 360.00 | | |
| LH-6-6 | 26.00 | | | 10.00 | | | 0.11 | U | U | 0.00 | M | | 62.00 | | | 70.00 | | |
| SC-3-10 | 72.00 | | | 62.00 | | | 0.14 | UN | U | 0.00 | M | | 39.00 | | | 60.00 | | |
| SC-3-2 | 43.00 | | | 43.00 | | | 0.12 | UN | U | 0.00 | M | | 95.00 | | | 85.00 | | |
| SC-3-6 | 19.00 | | | 207.00 | | | 0.11 | U | U | 0.00 | M | | 41.00 | | | 350.00 | | |
| SC-4-1 | 75600.00 | J | 20885.00 | | | | 15.00 | N | J | 0.00 | M | | 36200.00 | | | 21850.00 | | |
| SC-4-3 | 836.00 | | | 359.00 | | | 0.19 | N | J | 0.00 | M | | 380.00 | | | 179.00 | | |
| SC-5-4 | 330.00 | | | 158.00 | | | 3.20 | N | J | 0.00 | M | | 721.00 | N | J | 515.00 | | |
| SC-5-7 | 108.00 | | | 62.00 | | | 0.15 | U | U | 0.00 | M | | 61.00 | | | 123.00 | | |
| TH-2-4 | 161.00 | J | 170.00 | | | | 0.26 | UN | UJ | 0.00 | M | | 281.00 | | J | 325.00 | | |
| TH-2-7 | 15.00 | J | 28.00 | | | | 0.11 | UN | UJ | 0.00 | M | | 84.00 | J | | 102.00 | | |
| WD-2-4 | 324.00 | | | 168.00 | | | 0.75 | N | J | 0.00 | M | | 628.00 | N | J | 480.00 | | |
| WD-2-5 | 66.00 | | | 156.00 | | | 0.34 | J | | 0.00 | M | | 284.00 | | | 499.00 | | |
| WD-3-2 | 469.00 | | | 310.00 | | | 2.10 | J | | 0.00 | M | | 1140.00 | | | 897.00 | | |
| WD-5-1 | 717.00 | | | 889.00 | | | 3.20 | J | | 0.00 | M | | 783.00 | | | 903.00 | | |
| WD-5-4 | 42.00 | | | 45.00 | | | 0.17 | J | | 0.00 | M | | 98.00 | | | 78.00 | | |

Lab and Reviewer Codes: N = Spike recovery not within control limit, J = Value is an estimate, U = Actual value "less than" reported value,
R = Data unusable, M = Missing value.

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0080226

Soil Core Data
East Helena Smelter Site

Samples Used In The Paired T-Test and
Linear Regression Analysis

Table 3. Soil core data collected from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) an ASRCo for the parameters As, Cd and Cu. Only samples shown in the paired t-test are shown.

| Sample ID | CLP As (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCo As (mg/kg) | ASRCo Lab Codes | ASRCo Rev. | CLP Cd (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCo Cd (mg/kg) | ASRCo Lab Codes | ASRCo Rev. | CLP Cu (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCo Cu (mg/kg) | ASRCo Lab Codes | ASRCo Rev. |
|-----------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|
| DH-1-1 | 108.00 | N | J | 66.00 | | | 60.00 | N | J | 13.00 | | | 0.00 | | | 0.00 | | |
| DH-1-2 | 95.00 | | | 107.00 | | | 48.00 | | | 44.00 | | | 324.00 | | | 280.00 | | |
| DH-1-5 | 26.00 | | | 23.00 | | | 1.90 | | | 2.80 | | | 21.00 | | | 23.00 | | |
| DH-1-7 | 26.00 | | | 47.00 | | | 1.40 | | | 0.90 | | | 25.00 | | | 29.00 | | |
| DH-10-1 | 50.00 | N | | 119.00 | | | 12.00 | | | 19.00 | | | 830.00 | | | 148.00 | | |
| DH-10-4 | 22.00 | N | | 27.00 | | | 1.60 | | | 2.10 | | | 81.00 | | | 88.00 | | |
| DH-10-7 | 1010.00 | N | | 859.00 | | | 197.00 | | | 127.00 | | | 1650.00 | | | 593.00 | | |
| DH-13-1 | 4120.00 | N | J | 3163.00 | | | 1410.00 | N | J | 1610.00 | | | 0.00 | | | 0.00 | | |
| DH-13-3 | 32.00 | | | 28.00 | | | 1.50 | | | 2.10 | | | 86.00 | | | 88.00 | | |
| DH-13-4 | 15.00 | | | 28.00 | | | 5.40 | | | 2.20 | | | 184.00 | | | 91.00 | | |
| DH-13-7 | 31.00 | N | | 27.00 | | | 1.20 | | | 0.60 | | | 30.00 | | | 31.00 | | |
| DH-17-1 | 2740.00 | | | 2513.00 | | | 244.00 | | | 202.00 | | | 1450.00 | | | 1403.00 | | |
| DH-17-5 | 16.00 | | | 18.00 | | | 0.00 | | | 0.00 | | | 15.00 | | | 12.00 | | |
| DH-17-7 | 11.00 | | | 3.80 | | | 0.00 | | | 0.00 | | | 17.00 | | | 18.00 | | |
| DH-19-5 | 4740.00 | | | 12000.00 | | | 239.00 | | | 425.00 | | | 205.00 | | | 265.00 | | |
| DH-19-8 | 354.00 | | | 225.00 | | | 145.00 | | | 230.00 | | | 228.00 | | | 245.00 | | |
| DH-2-1 | 80.00 | N | | 138.00 | | | 76.00 | | | 141.00 | | | 203.00 | | | 280.00 | | |
| DH-2-4 | 15.00 | | | 23.00 | | | 0.00 | | | 0.00 | | | 20.00 | | | 25.00 | | |
| DH-20-9 | 15.00 | | | 24.00 | | | 0.00 | | | 0.00 | | | 46.00 | | | 71.00 | | |
| DH-21-3 | 418.00 | | | 325.00 | | | 1.90 | | | 4.50 | | | 78.00 | | | 340.00 | | |
| DH-21-9 | 301.00 | | | 550.00 | | | 1.50 | | | 1.00 | | | 56.00 | | | 37.00 | | |
| DH-22-11 | 385.00 | | | 18.00 | | | 37.00 | | | 2.00 | | | 79.00 | | | 13.00 | | |
| DH-22-6 | 5.50 | | | 11.00 | | | 0.00 | | | 0.00 | | | 16.00 | | | 31.00 | | |
| DH-23-3 | 175.00 | | | 125.00 | | | 23.00 | | | 23.00 | | | 1630.00 | | | 2350.00 | | |
| DH-23-6 | 721.00 | J | | 700.00 | | | 133.00 | J | | 150.00 | | | 3280.00 | J | | 3100.00 | | |
| DH-24-11 | 148.00 | | | 75.00 | | | 0.00 | | | 0.00 | | | 91.00 | | | 68.00 | | |
| DH-24-5 | 5.70 | J | | 16.00 | | | 0.00 | | | 0.00 | | | 29.00 | J | | 26.00 | | |
| DH-26-3 | 134.00 | J | | 164.00 | | | 2.50 | J | | 2.50 | | | 40.00 | J | | 28.00 | | |
| DH-26-7 | 117.00 | | | 100.00 | | | 1.40 | | | 1.50 | | | 62.00 | | | 90.00 | | |
| DH-27-3 | 79.00 | | | 162.00 | | | 2.30 | | | 2.00 | | | 45.00 | | | 35.00 | | |
| DH-27-7 | 179.00 | | | 174.00 | | | 4.90 | | | 4.50 | | | 45.00 | | | 54.00 | | |

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Table 3. Continued.

| Sample | CLP ID | CLP As (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO As (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Cd (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Cd (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Cu (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Cu (mg/kg) | ASRCO Lab Codes | ASRCO Rev. |
|----------|-----------|----------------------|---------------------|-------------|------------------------|-----------------------|---------------|----------------------|---------------------|-------------|------------------------|-----------------------|---------------|----------------------|---------------------|-------------|------------------------|-----------------------|---------------|
| DH-28-10 | | 530.00 | | | 545.00 | | | 318.00 | | | 352.00 | | | 46.00 | | | 51.00 | | |
| DH-28-11 | | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | | 53.00 | | | 18.00 | | |
| DH-28-3 | | 120.00 | | J | 79.00 | | | 3.70 | | | 1.10 | | | 36.00 | | | 27.00 | | |
| DH-29-4 | | 263.00 | | | 305.00 | | | 44.00 | | | 58.00 | | | 485.00 | | | 650.00 | | |
| DH-29-6 | | 215.00 | N | J | 342.00 | | | 28.00 | N | J | 27.00 | | | 0.00 | | | 0.00 | | |
| DH-3-1 | | 97.00 | | | 102.00 | | | 62.00 | | | 34.00 | | | 89.00 | | | 83.00 | | |
| DH-3-4 | | 11.00 | N | | 13.00 | | | 0.00 | | | 0.00 | | | 19.00 | | | 18.00 | | |
| DH-3-7 | | 10.00 | N | | 13.00 | | | 0.00 | | | 0.00 | | | 20.00 | | | 17.00 | | |
| DH-6-1 | | 83.00 | N | | 129.00 | | | 28.00 | | | 36.00 | | | 5560.00 | | | 17425.00 | | |
| DH-6-5 | | 63.30 | N | | 54.00 | | | 11.00 | | | 7.50 | | | 1180.00 | | | 1153.00 | | |
| DH-6-7 | | 7.80 | N | | 9.50 | | | 0.00 | | | 0.00 | | | 54.00 | | | 41.00 | | |
| DH-7-1 | | 59.00 | | | 99.00 | | | 17.00 | | | 17.00 | | | 229.00 | | | 288.00 | | |
| DH-7-5 | | 45.00 | | | 54.00 | | | 7.30 | | | 12.00 | | | 64.00 | | | 45.00 | | |
| DH-7-6 | | 38.00 | N | J | 11.00 | | | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| DH-7-7 | | 7.70 | N | | 13.00 | | | 0.00 | | | 0.00 | | | 23.00 | | | 24.00 | | |
| EH-57-11 | | 7.00 | N | J | 11.00 | | | 6.70 | N | J | 2.50 | | | 0.00 | | | 0.00 | | |
| EH-59-2 | | 7.00 | N | J | 13.00 | | | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| EH-59-5 | | 9.80 | | | 18.00 | | | 21.00 | | | 1.50 | | | 50.00 | | | 44.00 | | |
| EH-61-5 | | 11.00 | | | 10.00 | | | 0.00 | | | 0.00 | | | 48.00 | | | 50.00 | | |
| LH-1-1 | | 2660.00 | | | 3050.00 | | | 102.00 | | | 430.00 | | | 483.00 | | | 1600.00 | | |
| LH-1-4 | | 81.00 | | | 112.00 | | | 11.00 | | | 3.00 | | | 66.00 | | | 50.00 | | |
| LH-1-6 | | 70.00 | | | 10.00 | | | 0.00 | | | 0.00 | | | 29.00 | | | 10.00 | | |
| LH-2-1 | | 4500.00 | | | 1200.00 | | | 965.00 | | | 246.00 | | | 2270.00 | | | 1550.00 | | |
| LH-2-5 | | 81.00 | | | 225.00 | | | 7.30 | | | 18.00 | | | 169.00 | | | 195.00 | | |
| LH-2-8 | | 11.00 | N | J | 18.00 | | | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| LH-3-1 | | 1650.00 | N | J | 570.00 | | | 245.00 | N | J | 66.00 | | | 0.00 | | | 0.00 | | |
| LH-3-5 | | 25.00 | | | 15.00 | | | 2.40 | | | 1.00 | | | 70.00 | | | 51.00 | | |
| LH-3-7 | | 4.40 | | | 23.00 | | | 0.00 | | | 0.00 | | | 13.00 | | | 58.00 | | |
| LH-4-1 | | 5150.00 | N | J | 1900.00 | | | 868.00 | N | J | 220.00 | | | 0.00 | | | 0.00 | | |
| LH-4-5 | | 544.00 | | | 550.00 | | | 24.00 | | | 41.00 | | | 324.00 | | | 500.00 | | |
| LH-4-9 | | 4.30 | | | 15.00 | | | 0.00 | | | 0.00 | | | 10.00 | | | 21.00 | | |
| LH-5-1 | | 47600.00 | N | J | 22500.00 | | | 9100.00 | N | J | 9500.00 | | | 0.00 | | | 0.00 | | |

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Table 3. Continued.

| Sample ID | CLP As (mg/kg) | CLP Codes | CLP Rev. | ASRCO As (mg/kg) | ASRCO Codes | ASRCO Rev. | CLP Cd (mg/kg) | CLP Codes | CLP Rev. | ASRCO Cd (mg/kg) | ASRCO Codes | ASRCO Rev. | CLP Cu (mg/kg) | CLP Codes | CLP Rev. | ASRCO Cu (mg/kg) | ASRCO Codes | ASRCO Rev. |
|-----------|----------------|-----------|----------|------------------|-------------|------------|----------------|-----------|----------|------------------|-------------|------------|----------------|-----------|----------|------------------|-------------|------------|
| LH-5-5 | 33.00 | N | | 33.00 | | | 0.00 | | | 0.00 | | | 100.00 | | | 75.00 | | |
| LH-5-7 | 4.50 | | | 5.00 | | | 0.00 | | | 0.00 | | | 10.00 | | | 7.00 | | |
| LH-6-1 | 3410.00 | N | | 5800.00 | | | 252.00 | | | 455.00 | | | 1340.00 | | | 1690.00 | | |
| LH-6-3 | 136.00 | N | J | 65.00 | | | 50.00 | N | J | 9.00 | | | 0.00 | | | 0.00 | | |
| LH-6-6 | 13.00 | | | 12.00 | | | 0.00 | | | 0.00 | | | 17.00 | | | 22.00 | | |
| SC-3-10 | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | | 14.00 | | | 15.00 | | |
| SC-3-2 | 14.00 | N | | 17.00 | | | 0.00 | | | 0.00 | | | 30.00 | | | 25.00 | | |
| SC-3-6 | 17.00 | | | 357.00 | | | 1.10 | | | 307.00 | | | 19.00 | | | 38.00 | | |
| SC-4-1 | 1940.00 | N | | 1273.00 | | | 201.00 | | | 110.00 | | | 20800.00 | | | 14500.00 | | |
| SC-4-3 | 34.00 | N | | 36.00 | | | 3.90 | | | 13.00 | | | 244.00 | | | 102.00 | | |
| SC-5-4 | 518.00 | N | J | 475.00 | | | 156.00 | N | J | 94.00 | | | 0.00 | | | 0.00 | | |
| SC-5-7 | 23.00 | | | 24.00 | | | 5.80 | | | 6.80 | | | 26.00 | | | 39.00 | | |
| TH-2-4 | 19.00 | N | J | 22.00 | | | 2.70 | N | J | 3.40 | | | 0.00 | | | 0.00 | | |
| TH-2-7 | 91.00 | N | J | 164.00 | | | 2.40 | N | J | 3.00 | | | 0.00 | | | 0.00 | | |
| WD-2-4 | 164.00 | N | J | 140.00 | | | 61.00 | N | J | 37.00 | | | 0.00 | | | 0.00 | | |
| WD-2-5 | 103.00 | | J | 74.00 | | | 20.00 | | | 48.00 | | | 43.00 | | | 43.00 | | |
| WD-3-2 | 79.00 | | | 104.00 | | | 175.00 | | | 126.00 | | | 103.00 | J | | 41.00 | | |
| WD-5-1 | 58.00 | | | 169.00 | | | 62.00 | | | 68.00 | | | 71.00 | | | 87.00 | | |
| WD-5-4 | 22.00 | | | 32.00 | | | 4.40 | | | 2.80 | | | 29.00 | | | 27.00 | | |

Lab and Reviewer Codes: N = Sike recovery not within control limit, J = Value is an estimate, U = Actual value "less than" reported value.

A value of 0.00 implies no data was used in the analysis.

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Table 4. Soil core data collected from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) an ASRCo for the parameters Pb, Hg and Zn. Only samples used in the paired t-test analysis are shown.

| Sample ID | CLP Pb (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCo Pb (mg/kg) | ASRCo Lab Codes | ASRCo Rev. | CLP Hg (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCo Hg (mg/kg) | ASRCo Lab Codes | ASRCo Rev. | CLP Zn (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCo Zn (mg/kg) | ASRCo Lab Codes | ASRCo Rev. |
|-----------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|
| DH-1-1 | 1840.00 | | | 373.00 | | | 0.00 | | | 0.00 | | | 1250.00 | N | J | 285.00 | | |
| DH-1-2 | 1380.00 | | | 1655.00 | | | 0.00 | | | 0.00 | | | 1180.00 | | | 1081.00 | | |
| DH-1-5 | 64.00 | | | 117.00 | | | 0.00 | | | 0.00 | | | 68.00 | | | 86.00 | | |
| DH-1-7 | 36.00 | | | 35.00 | | | 0.00 | | | 0.00 | | | 45.00 | | | 50.00 | | |
| DH-10-1 | 712.00 | | | 1308.00 | | | 0.00 | | | 0.00 | | | 2760.00 | | | 4333.00 | | |
| DH-10-4 | 230.00 | | | 258.00 | | | 0.00 | | | 0.00 | | | 1270.00 | | | 1188.00 | | |
| DH-10-7 | 6920.00 | | | 7993.00 | | | 0.00 | | | 0.00 | | | 4760.00 | | | 3560.00 | | |
| DH-13-1 | 33400.00 | | | 24200.00 | | | 0.00 | | | 0.00 | | | 14000.00 | N | J | 14450.00 | | |
| DH-13-3 | 213.00 | | | 209.00 | | | 0.00 | | | 0.00 | | | 91.00 | | | 112.00 | | |
| DH-13-4 | 233.00 | | | 127.00 | | | 0.00 | | | 0.00 | | | 294.00 | | | 126.00 | | |
| DH-13-7 | 99.00 | | | 86.00 | | | 0.00 | | | 0.00 | | | 73.00 | | | 42.00 | | |
| DH-17-1 | 33800.00 | | | 18925.00 | | | 0.00 | | | 0.00 | | | 21200.00 | | | 20500.00 | | |
| DH-17-5 | 30.00 | | | 29.00 | | | 0.00 | | | 0.00 | | | 39.00 | | | 44.00 | | |
| DH-17-7 | 16.00 | | | 24.00 | | | 0.00 | | | 0.00 | | | 29.00 | | | 29.00 | | |
| DH-19-5 | 294.00 | | | 800.00 | | | 0.00 | | | 0.00 | | | 1220.00 | | | 1200.00 | | |
| DH-19-8 | 164.00 | | | 115.00 | | | 0.00 | | | 0.00 | | | 306.00 | | | 315.00 | | |
| DH-2-1 | 2160.00 | | | 4190.00 | | | 0.00 | | | 0.00 | | | 649.00 | | | 1134.00 | | |
| DH-2-4 | 33.00 | | | 55.00 | | | 0.00 | | | 0.00 | | | 53.00 | | | 71.00 | | |
| DH-20-9 | 28.00 | | | 100.00 | | | 0.00 | | | 0.00 | | | 42.00 | | | 135.00 | | |
| DH-21-3 | 36.00 | | | 185.00 | | | 0.00 | | | 0.00 | | | 73.00 | | | 115.00 | | |
| DH-21-9 | 29.00 | | | 14.00 | | | 0.00 | | | 0.00 | | | 38.00 | | | 67.00 | | |
| DH-22-11 | 62.00 | | | 69.00 | | | 0.00 | | | 0.00 | | | 126.00 | | | 67.00 | | |
| DH-22-6 | 26.00 | | | 27.00 | | | 0.00 | | | 0.00 | | | 24.00 | | | 38.00 | | |
| DH-23-3 | 12800.00 | | | 10750.00 | | | 0.00 | | | 0.00 | | | 35000.00 | J | | 3950.00 | | |
| DH-23-6 | 34500.00 | J | | 12750.00 | | | 0.00 | | | 0.00 | | | 51700.00 | J | | 44000.00 | | |
| DH-24-11 | 55.00 | | | 135.00 | | | 0.00 | | | 0.00 | | | 179.00 | | | 115.00 | | |
| DH-24-5 | 11.00 | J | | 23.00 | | | 0.00 | | | 0.00 | | | 79.00 | J | | 62.00 | | |
| DH-26-3 | 73.00 | J | | 105.00 | | | 0.00 | | | 0.00 | | | 123.00 | J | | 100.00 | | |
| DH-26-7 | 25.00 | | | 42.00 | | | 0.00 | | | 0.00 | | | 41.00 | | | 81.00 | | |
| DH-27-3 | 23.00 | | | 7.00 | | | 0.00 | | | 0.00 | | | 38.00 | | | 38.00 | | |
| DH-27-7 | 26.00 | | | 16.00 | | | 0.00 | | | 0.00 | | | 1260.00 | | | 1500.00 | | |

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Table 4. Continued.

| Sample ID | CLP Pb (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Pb (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Hg (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Hg (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Zn (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Zn (mg/kg) | ASRCO Lab Codes | ASRCO Rev. |
|-----------|-------------------|------------------|----------|---------------------|--------------------|------------|-------------------|------------------|----------|---------------------|--------------------|------------|-------------------|------------------|----------|---------------------|--------------------|------------|
| DH-28-10 | 13.00 | | | 18.00 | | | 0.00 | | | 0.00 | | | 1310.00 | | | 1225.00 | | |
| DH-28-11 | 46.00 | | | 28.00 | | | 0.00 | | | 0.00 | | | 84.00 | | | 97.00 | | |
| DH-28-3 | 49.00 | | | 22.00 | | | 0.00 | | | 0.00 | | | 144.00 | | | 46.00 | | |
| DH-29-4 | 4630.00 | | | 6720.00 | | | 0.00 | | | 0.00 | | | 3500.00 | | | 3525.00 | | |
| DH-29-6 | 6330.00 | | | 9523.00 | | | 0.00 | | | 0.00 | | | 6810.00 | N | J | 9350.00 | | |
| DH-3-1 | 1820.00 | | | 1139.00 | | | 0.00 | | | 0.00 | | | 360.00 | | | 267.00 | | |
| DH-3-4 | 12.70 | | | 32.00 | | | 0.00 | | | 0.00 | | | 30.00 | | | 39.00 | | |
| DH-3-7 | 12.00 | | | 22.00 | | | 0.00 | | | 0.00 | | | 43.00 | | | 37.00 | | |
| DH-6-1 | 1240.00 | | | 1738.00 | | | 0.00 | | | 0.00 | | | 990.00 | | | 16475.00 | | |
| DH-6-5 | 416.00 | | | 270.00 | | | 0.00 | | | 0.00 | | | 499.00 | | | 298.00 | | |
| DH-6-7 | 30.00 | | | 41.00 | | | 0.00 | | | 0.00 | | | 79.00 | | | 91.00 | | |
| DH-7-1 | 645.00 | | | 889.00 | | | 0.00 | | | 0.00 | | | 335.00 | | | 518.00 | | |
| DH-7-5 | 382.00 | | | 302.00 | | | 0.00 | | | 0.00 | | | 258.00 | | | 247.00 | | |
| DH-7-6 | 269.00 | | | 30.00 | | | 0.00 | | | 0.00 | | | 156.00 | N | J | 42.00 | | |
| DH-7-7 | 23.00 | | | 30.00 | | | 0.00 | | | 0.00 | | | 41.00 | | | 40.00 | | |
| EH-57-11 | 170.00 | | | 25.00 | | | 0.00 | | | 0.00 | | | 88.00 | N | J | 29.00 | | |
| EH-59-2 | 16.00 | J | 14.00 | | | | 0.00 | | | 0.00 | | | 94.00 | N | J | 100.00 | | |
| EH-59-5 | 21.00 | | | 19.00 | | | 0.00 | | | 0.00 | | | 91.00 | | | 81.00 | | |
| EH-61-5 | 19.00 | | | 20.00 | | | 0.00 | | | 0.00 | | | 44.00 | | | 45.00 | | |
| LH-1-1 | 2320.00 | | | 8500.00 | | | 0.00 | | | 0.00 | | | 3220.00 | | | 4450.00 | | |
| LH-1-4 | 278.00 | | | 160.00 | | | 0.00 | | | 0.00 | | | 327.00 | | | 235.00 | | |
| LH-1-6 | 228.00 | | | 10.00 | | | 0.00 | | | 0.00 | | | 94.00 | | | 41.00 | | |
| LH-2-1 | 9580.00 | | | 7500.00 | | | 0.00 | | | 0.00 | | | 8540.00 | | | 6500.00 | | |
| LH-2-5 | 377.00 | | | 1400.00 | | | 0.00 | | | 0.00 | | | 620.00 | | | 965.00 | | |
| LH-2-8 | 10.00 | J | 35.00 | | | | 0.00 | | | 0.00 | | | 49.00 | N | J | 115.00 | | |
| LH-3-1 | 5690.00 | | | 1550.00 | | | 0.00 | | | 0.00 | | | 7290.00 | N | J | 2450.00 | | |
| LH-3-5 | 113.00 | | | 45.00 | | | 0.00 | | | 0.00 | | | 168.00 | | | 130.00 | | |
| LH-3-7 | 7.50 | | | 30.00 | | | 0.00 | | | 0.00 | | | 32.00 | | | 95.00 | | |
| LH-4-1 | 12600.00 | | | 4450.00 | | | 0.00 | | | 0.00 | | | 11700.00 | N | J | 4950.00 | | |
| LH-4-5 | 1630.00 | | | 3450.00 | | | 0.00 | | | 0.00 | | | 1730.00 | | | 2400.00 | | |
| LH-4-9 | 8.10 | | | 5.00 | | | 0.00 | | | 0.00 | | | 17.00 | | | 16.00 | | |
| LH-5-1 | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | | 52200.00 | N | J | 28500.00 | | |

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Table 4. Continued.

| Sample ID | CLP Pb (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Pb (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Hg (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Hg (mg/kg) | ASRCO Lab Codes | ASRCO Rev. | CLP Zn (mg/kg) | CLP Lab Codes | CLP Rev. | ASRCO Zn (mg/kg) | ASRCO Lab Codes | ASRCO Rev. |
|-----------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|----------------|---------------|----------|------------------|-----------------|------------|
| LH-5-5 | 50.00 | | | 50.00 | | | 0.00 | | | 0.00 | | | 170.00 | | | 160.00 | | |
| LH-5-7 | 5.70 | | | 10.00 | | | 0.00 | | | 0.00 | | | 36.00 | | | 19.00 | | |
| LH-6-1 | 6400.00 | | | 9500.00 | | | 0.00 | | | 0.00 | | | 10400.00 | | | 8550.00 | | |
| LH-6-3 | 595.00 | | | 335.00 | | | 0.00 | | | 0.00 | | | 1690.00 | N | J | 360.00 | | |
| LH-6-6 | 26.00 | | | 10.00 | | | 0.00 | | | 0.00 | | | 62.00 | | | 70.00 | | |
| SC-3-10 | 72.00 | | | 62.00 | | | 0.00 | | | 0.00 | | | 39.00 | | | 60.00 | | |
| SC-3-2 | 43.00 | | | 43.00 | | | 0.00 | | | 0.00 | | | 95.00 | | | 85.00 | | |
| SC-3-6 | 19.00 | | | 207.00 | | | 0.00 | | | 0.00 | | | 41.00 | | | 350.00 | | |
| SC-4-1 | 75600.00 | J | 20885.00 | | | | 0.00 | | | 0.00 | | | 36200.00 | | | 21850.00 | | |
| SC-4-3 | 836.00 | | | 359.00 | | | 0.00 | | | 0.00 | | | 380.00 | | | 179.00 | | |
| SC-5-4 | 330.00 | | | 158.00 | | | 0.00 | | | 0.00 | | | 721.00 | N | J | 515.00 | | |
| SC-5-7 | 108.00 | | | 62.00 | | | 0.00 | | | 0.00 | | | 61.00 | | | 123.00 | | |
| TH-2-4 | 161.00 | J | 170.00 | | | | 0.00 | | | 0.00 | | | 281.00 | | J | 325.00 | | |
| TH-2-7 | 15.00 | J | 28.00 | | | | 0.00 | | | 0.00 | | | 84.00 | J | | 102.00 | | |
| WD-2-4 | 324.00 | | | 168.00 | | | 0.00 | | | 0.00 | | | 628.00 | N | J | 480.00 | | |
| WD-2-5 | 66.00 | | | 156.00 | | | 0.00 | | | 0.00 | | | 284.00 | | | 499.00 | | |
| WD-3-2 | 469.00 | | | 310.00 | | | 0.00 | | | 0.00 | | | 1140.00 | | | 897.00 | | |
| WD-5-1 | 717.00 | | | 889.00 | | | 0.00 | | | 0.00 | | | 783.00 | | | 903.00 | | |
| WD-5-4 | 42.00 | | | 45.00 | | | 0.00 | | | 0.00 | | | 98.00 | | | 78.00 | | |

Lab and Reviewer Codes: N = Spike recovery not within control limit, J = Value is an estimate, U = Actual value "less than" reported value.
A value of 0.00 implies no data was used in the analysis.

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**Surface Water Data
Total Metals
East Helena Smelter Site**

Full Data Base

Table 7. Surface water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the total metals As, Cd and Fe. The full data set is shown.

| Site ID | Sample Number | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO |
|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|
| | | As (mg/l) | Lab Codes | Rev. Codes | As (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Fe (mg/l) | Lab Codes | Rev. Codes | Fe (mg/l) | Lab Codes | Rev. Codes |
| PPC-3 | 8610-124 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | U | U | .213 | | | .262 | | |
| PPC-3(REP) | 8610-103 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | U | U | .216 | | | .262 | | |
| PPC-29A | 8610-131 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | U | U | .226 | | | .280 | | |
| PPC-30A | 8610-132 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | U | U | .177 | | | .250 | | |
| PPC-5 | 8610-126 | .0100 | A | | .0080 | | | .0050 | U | U | .0010 | U | U | .278 | | | .300 | | |
| PPC-5 | 8705-107 | .0119 | D | J | .0150 | | | .0040 | U | U | .0010 | | | .430 | | | .339 | | |
| PPC-7 | 8705-111 | .0440 | A | J | .0125 | | | .0040 | U | U | .0010 | | | .417 | | | .360 | | |
| PPC-35A | 8705-117 | .0090 | UN | UJ | .0125 | | | .0040 | U | U | .0020 | | | .494 | | | .500 | | |
| PPC-9 | 8705-119 | .0090 | UN | UJ | .0100 | | | .0070 | | | .0010 | | | .434 | | | .080 | | |
| PPC-9(REP) | 8705-125 | .0140 | 1 | J | .0125 | | | .0040 | U | U | .0010 | | | .425 | | | .399 | | |
| BLANK | 8705-123 | .0090 | UN | UJ | .0060 | U | U | .0040 | U | U | .0010 | | | .100 | U | U | .020 | | |
| PPC-3 | 8705-100 | .0090 | UN | UJ | .0100 | | | .0040 | U | U | .0010 | | | .562 | | | .554 | | |
| PPC-29A | 8705-101 | .0280 | A | J | .0080 | | | .0040 | U | U | .0010 | | | .487 | | | .621 | | |
| PPC-30A | 8705-105 | .0090 | UN | UJ | .0330 | | | .0040 | U | U | .0010 | | | .602 | | | .575 | | |
| PPC-31A | 8705-106 | .0164 | N | J | .0090 | | | .0060 | | | .0030 | | | .469 | | | .353 | | |
| PPC-33A | 8705-109 | .0130 | N | J | .0180 | | | .0040 | U | U | .0020 | | | .445 | | | .375 | | |
| PPC-31A(REP) | 8705-126 | .0230 | N | J | .0130 | | | .0040 | U | U | .0010 | | | .423 | | | .314 | | |
| BLANK | 8705-124 | .0290 | N | J | .0060 | U | U | .0040 | | | .0020 | | | .100 | U | U | .020 | U | U |
| PPC-35A | 8610-137 | .0100 | | | .0090 | | | .0050 | U | U | .0010 | U | U | .318 | | | .325 | | |
| PPC-7 | 8610-128 | .0120 | | | .0140 | | | .0050 | U | U | .0010 | U | U | .249 | | | .262 | | |
| BLANK | 8610-122 | .0000 | M | | .0060 | U | U | .0000 | M | | .0010 | U | U | .000 | M | | .020 | U | U |
| BLANK | 8610-122 | .0000 | M | | .0060 | U | U | .0000 | M | | .0010 | U | U | .000 | M | | .020 | U | U |
| BLANK | 8610-123 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | U | U | .026 | D | | .025 | | |
| PPC-9(REP) | 8610-104 | .0110 | | | .0090 | | | .0050 | U | U | .0010 | U | U | .230 | | | .288 | | |
| PPC-9 | 8610-130 | .0100 | | | .0100 | | | .0050 | U | U | .0010 | | | .249 | | | .288 | | |
| PPC-33A | 8610-135 | .0120 | | | .0110 | | | .0050 | U | U | .0010 | U | U | .230 | | | .262 | | |
| PPC-38A | 8708-70 | .0320 | | | .0350 | | | .0008 | | | .0010 | | | .259 | | | .279 | | |
| PPC-8 | 8708-64 | .0170 | | | .0230 | | | .0010 | | | .0010 | | | .322 | | | .333 | | |
| PPC-8(REP) | 8708-50 | .0180 | | | .0220 | | | .0010 | | | .0010 | U | U | .322 | | | .311 | | |
| PPC-6 | 8708-60 | .0210 | | | .0250 | | | .0009 | | | .0010 | | | .301 | | | .325 | | |

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Table 7. Continued.

| Site ID | Sample Number | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO |
|------------|------------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|
| | | As (mg/l) | Lab Codes | Rev. Codes | As (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Fe (mg/l) | Lab Codes | Rev. Codes | Fe (mg/l) | Lab Codes | Rev. Codes |
| PPC-5 | 8708-57 | .0160 | | | .0210 | | | .0010 | | | .0010 | U | U | .301 | | | .328 | | |
| PPC-4 | 8708-54 | .0060 | D | | .0083 | | | .0002 | D | | .0010 | U | U | .205 | | | .228 | | |
| PPC-29A | 8708-53 | .0060 | D | | .0090 | | | .0002 | D | | .0010 | U | U | .176 | | | .213 | | |
| PPC-3 | 8708-52 | .0060 | D | | .0090 | | | .0002 | D | | .0010 | U | U | .191 | | | .189 | | |

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Table 5. Surface water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the total metals Pb and Zn. The full data set is shown.

| Site ID | Sample Number | CLP Pb (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Pb (mg/l) | ASRCO Lab Codes | ASRCO Rev. | CLP Zn (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Zn (mg/l) | ASRCO Lab Codes | ASRCO Rev. |
|--------------|------------------|---------------------|---------------------|-------------|-----------------------|-----------------------|---------------|---------------------|---------------------|-------------|-----------------------|-----------------------|---------------|
| PPC-3 | 8610-124 | .0050 | U | U | .0050 | U | U | .070 | | | .079 | | |
| PPC-3(REP) | 8610-103 | .0050 | US | U | .0050 | U | U | .072 | | | .080 | | |
| PPC-29A | 8610-131 | .0053 | | | .0050 | | | .039 | | | .078 | | |
| PPC-30A | 8610-132 | .0050 | U | U | .0050 | | | .066 | | | .066 | | |
| PPC-5 | 8610-126 | .0150 | | | .0170 | | | .059 | | | .062 | | |
| PPC-5 | 8705-107 | .1260 | C | J | .0160 | | | .122 | * | J | .055 | | |
| PPC-7 | 8705-111 | .0234 | A | J | .0250 | | | .133 | * | J | .059 | | |
| PPC-35A | 8705-117 | .0220 | N | J | .0170 | | | .071 | * | J | .061 | | |
| PPC-9 | 8705-119 | .0195 | N | J | .0050 | U | U | .083 | * | J | .021 | | |
| PPC-9(REP) | 8705-125 | .0340 | G | J | .0270 | | | .071 | * | J | .054 | | |
| BLANK | 8705-123 | .0030 | UN | UJ | .0050 | U | U | .020 | U* | UJ | .008 | U | U |
| PPC-3 | 8705-100 | .0520 | G | J | .0090 | | | .105 | * | J | .069 | | |
| PPC-29A | 8705-101 | .0570 | * | J | .0108 | | | .091 | * | J | .078 | | |
| PPC-30A | 8705-105 | .0500 | * | J | .0113 | | | .098 | * | J | .080 | | |
| PPC-31A | 8705-106 | .0366 | N | | .0240 | | | .062 | * | J | .050 | | |
| PPC-33A | 8705-109 | .0610 | G | J | .0260 | | | .070 | G | J | .058 | | |
| PPC-31A(REP) | 8705-126 | .0710 | * | | .0220 | | | .097 | * | | .045 | | |
| BLANK | 8705-124 | .0142 | N | J | .0050 | U | U | .020 | U* | U | .008 | U | U |
| PPC-35A | 8610-137 | .0140 | | | .0140 | | | .070 | | | .069 | | |
| PPC-7 | 8610-128 | .0110 | | | .0160 | | | .059 | | | .060 | | |
| BLANK | 8610-122 | | M | | .0050 | U | U | | M | | .008 | U | U |
| BLANK | 8610-122 | | M | | .0050 | U | U | | M | | .008 | U | U |
| BLANK | 8610-123 | .0050 | U | U | .0050 | U | U | .006 | D | | .008 | U | U |
| PPC-9(REP) | 8610-104 | .0180 | | | .0120 | | | .068 | | | .064 | | |
| PPC-9 | 8610-130 | .0120 | | | .0140 | | | .063 | | | .064 | | |
| PPC-33A | 8610-135 | .0120 | | | .0130 | | | .066 | | | .061 | | |
| PPC-38A | 8708-70 | .0170 | | | .0210 | | | .045 | | | .044 | | |
| PPC-8 | 8708-64 | .0280 | | | .0270 | | | .054 | | | .051 | | |
| PPC-8(REP) | 8708-50 | .0290 | | | .0250 | | | .053 | | | .051 | | |
| PPC-6 | 8708-60 | .0260 | | | .0200 | | | .051 | | | .048 | | |
| PPC-5 | 8708-57 | .0300 | | | .0220 | | | .043 | | | .043 | | |
| PPC-4 | 8708-54 | .0050 | | | .0098 | | | .045 | | | .043 | | |
| PPC-29A | 8708-53 | .0040 | | | .0099 | | | .038 | | | .036 | | |
| PPC-3 | 8708-52 | .0030 | | | .0060 | | | .044 | | | .035 | | |

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**Surface Water Data
Total Metals
East Helena Smelter Site**

**Samples Used In The Paired T-Test and
Linear Regression Analysis**

Table 8. Surface water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the total metals As, Cd and Fe. Only samples used in the paired t-test analysis are shown.

| Site ID | Sample Number | CLP (mg/l) | CLP Codes | CLP Rev. | ASRCO (mg/l) | ASRCO Codes | ASRCO Rev. | CLP (mg/l) | CLP Codes | CLP Rev. | ASRCO (mg/l) | ASRCO Codes | ASRCO Rev. | CLP (mg/l) | CLP Codes | CLP Rev. | ASRCO (mg/l) | ASRCO Codes | ASRCO Rev. | |
|--------------|------------------|---------------|--------------|-------------|-----------------|----------------|---------------|---------------|--------------|-------------|-----------------|----------------|---------------|---------------|--------------|-------------|-----------------|----------------|---------------|--|
| PPC-3 | 8610-124 | | | | | | | | | | | | | .213 | | | .262 | | | |
| PPC-3(REP) | 8610-103 | | | | | | | | | | | | | .216 | | | .262 | | | |
| PPC-29A | 8610-131 | | | | | | | | | | | | | .226 | | | .280 | | | |
| PPC-30A | 8610-132 | | | | | | | | | | | | | .177 | | | .250 | | | |
| PPC-5 | 8610-126 | .0100 | A | | .0080 | | | | | | | | | .278 | | | .300 | | | |
| PPC-5 | 8705-107 | .0119 | D | J | .0150 | | | | | | | | | .430 | | | .339 | | | |
| PPC-7 | 8705-111 | .0440 | A | J | .0125 | | | | | | | | | .417 | | | .360 | | | |
| PPC-35A | 8705-117 | | | | | | | | | | | | | .494 | | | .500 | | | |
| PPC-9 | 8705-119 | | | | | | | .0070 | | | .0010 | | | .434 | | | .080 | | | |
| PPC-9(REP) | 8705-125 | .0140 | I | J | .0125 | | | | | | | | | .425 | | | .399 | | | |
| BLANK | 8705-123 | | | | | | | | | | | | | .562 | | | .554 | | | |
| PPC-3 | 8705-100 | | | | | | | | | | | | | .487 | | | .621 | | | |
| PPC-29A | 8705-101 | .0280 | A | J | .0080 | | | | | | | | | .602 | | | .575 | | | |
| PPC-30A | 8705-105 | | | | | | | | | | | | | .469 | | | .353 | | | |
| PPC-31A | 8705-106 | .0164 | N | J | .0090 | | | .0060 | | | .0030 | | | .445 | | | .375 | | | |
| PPC-33A | 8705-109 | .0130 | N | J | .0180 | | | | | | | | | .423 | | | .314 | | | |
| PPC-31A(REP) | 8705-126 | .0230 | N | J | .0130 | | | | .0040 | | .0020 | | | | .318 | | | .325 | | |
| BLANK | 8705-124 | | | | | | | | | | | | | .249 | | | .262 | | | |
| PPC-35A | 8610-137 | .0100 | | | .0090 | | | | | | | | | .026 | D | | .025 | | | |
| PPC-7 | 8610-128 | .0120 | | | .0140 | | | | | | | | | .230 | | | .288 | | | |
| BLANK | 8610-122 | | | | | | | | | | | | | .249 | | | .288 | | | |
| BLANK | 8610-122 | | | | | | | | | | | | | .230 | | | .262 | | | |
| BLANK | 8610-123 | | | | | | | | | | | | | .230 | | | .279 | | | |
| PPC-9(REP) | 8610-104 | .0110 | | | .0090 | | | | | | | | | .259 | | | .333 | | | |
| PPC-9 | 8610-130 | .0100 | | | .0100 | | | | | | | | | .249 | | | .311 | | | |
| PPC-33A | 8610-135 | .0120 | | | .0110 | | | | | | | | | .230 | | | .279 | | | |
| PPC-38A | 8708-70 | .0320 | | | .0350 | | | .0008 | | | .0010 | | | .322 | | | .333 | | | |
| PPC-8 | 8708-64 | .0170 | | | .0230 | | | .0010 | | | .0010 | | | .322 | | | .311 | | | |
| PPC-8(REP) | 8708-50 | .0180 | | | .0220 | | | | | | | | | .301 | | | .325 | | | |
| PPC-6 | 8708-60 | .0210 | | | .0250 | | | .0009 | | | .0010 | | | | | | | | | |

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Table 8. Continued.

| Site ID | Sample Number | CLP | | | | ASRCo | | | | CLP | | | | ASRCo | | | | CLP | | | | ASRCo | | | |
|------------|------------------|--------------|--------------|--------------|------|--------------|--------------|--------------|------|--------------|--------------|--------------|------|--------------|--------------|--------------|------|--------------|--------------|--------------|------|--------------|--------------|----------------|----------------|
| | | As (mg/l) | Lab Codes | CLP Codes | Rev. | As (mg/l) | Lab Codes | CLP Codes | Rev. | Cd (mg/l) | Lab Codes | CLP Codes | Rev. | Cd (mg/l) | Lab Codes | CLP Codes | Rev. | Fe (mg/l) | Lab Codes | CLP Codes | Rev. | Fe (mg/l) | Lab Codes | ASRCo Codes | ASRCo Codes |
| PPC-5 | 8708-57 | .0160 | | | | .0210 | | | | | | | | | | | .301 | | | | | | .328 | | |
| PPC-4 | 8708-54 | .0060 | D | | | .0083 | | | | | | | | | | | .205 | | | | | | .228 | | |
| PPC-29A | 8708-53 | .0060 | D | | | .0090 | | | | | | | | | | | .176 | | | | | | .213 | | |
| PPC-3 | 8708-52 | .0060 | D | | | .0090 | | | | | | | | | | | .191 | | | | | | .189 | | |

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Table 6. Surface water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the total metals Pb and Zn. Only samples used in the paired t-test analysis are shown.

| Site ID | Sample Number | CLP Pb (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Pb (mg/l) | ASRCO Lab Codes | ASRCO Rev. | CLP Zn (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Zn (mg/l) | ASRCO Lab Codes | ASRCO Rev. |
|--------------|------------------|---------------------|---------------------|-------------|-----------------------|-----------------------|---------------|---------------------|---------------------|-------------|-----------------------|-----------------------|---------------|
| PPC-3 | 8610-124 | | | | | | | .0700 | | | .0790 | | |
| PPC-3(REP) | 8610-103 | | | | | | | .0720 | | | .0800 | | |
| PPC-29A | 8610-131 | .0053 | | | .0050 | | | .0390 | | | .0780 | | |
| PPC-30A | 8610-132 | | | | | | | .0660 | | | .0660 | | |
| PPC-5 | 8610-126 | .0150 | | | .0170 | | | .0590 | | | .0620 | | |
| PPC-5 | 8705-107 | .1260 | C | J | .0160 | | | .1220 | * | J | .0550 | | |
| PPC-7 | 8705-111 | .0234 | A | J | .0250 | | | .1330 | * | J | .0590 | | |
| PPC-35A | 8705-117 | .0220 | N | J | .0170 | | | .0710 | * | J | .0610 | | |
| PPC-9 | 8705-119 | | | | | | | .0830 | * | J | .0210 | | |
| PPC-9(REP) | 8705-125 | .0340 | G | J | .0270 | | | .0710 | * | J | .0540 | | |
| BLANK | 8705-123 | | | | | | | | | | | | |
| PPC-3 | 8705-100 | .0520 | G | J | .0090 | | | .1050 | * | J | .0690 | | |
| PPC-29A | 8705-101 | .0570 | * | J | .0108 | | | .0910 | * | J | .0780 | | |
| PPC-30A | 8705-105 | .0500 | * | J | .0113 | | | .0980 | * | J | .0800 | | |
| PPC-31A | 8705-106 | .0366 | N | | .0240 | | | .0620 | * | J | .0500 | | |
| PPC-33A | 8705-109 | .0610 | G | J | .0260 | | | .0700 | G | J | .0580 | | |
| PPC-31A(REP) | 8705-126 | .0710 | * | | .0220 | | | .0970 | * | | .0450 | | |
| BLANK | 8705-124 | | | | | | | | | | | | |
| PPC-35A | 8610-137 | .0140 | | | .0140 | | | .0700 | | | .0690 | | |
| PPC-7 | 8610-128 | .0110 | | | .0160 | | | .0590 | | | .0600 | | |
| BLANK | 8610-122 | | | | | | | | | | | | |
| BLANK | 8610-122 | | | | | | | | | | | | |
| BLANK | 8610-123 | | | | | | | | | | | | |
| PPC-9(REP) | 8610-104 | .0180 | | | .0120 | | | .0680 | | | .0640 | | |
| PPC-9 | 8610-130 | .0120 | | | .0140 | | | .0630 | | | .0640 | | |
| PPC-33A | 8610-135 | .0120 | | | .0130 | | | .0660 | | | .0610 | | |
| PPC-38A | 8708-70 | .0170 | | | .0210 | | | .0450 | | | .0440 | | |
| PPC-8 | 8708-64 | .0280 | | | .0270 | | | .0540 | | | .0510 | | |
| PPC-8(REP) | 8708-50 | .0290 | | | .0250 | | | .0530 | | | .0510 | | |
| PPC-6 | 8708-60 | .0260 | | | .0200 | | | .0510 | | | .0480 | | |
| PPC-5 | 8708-57 | .0300 | | | .0220 | | | .0430 | | | .0430 | | |
| PPC-4 | 8708-54 | .0050 | | | .0098 | | | .0450 | | | .0430 | | |
| PPC-29A | 8708-53 | .0040 | | | .0099 | | | .0380 | | | .0360 | | |
| PPC-3 | 8708-52 | .0030 | | | .0060 | | | .0440 | | | .0350 | | |

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**Surface Water Data
Dissolved Metals
East Helena Smelter Site**

Full Data Base

Table 1. Surface water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the dissolved metals As, Cd and Fe. The full data set is shown.

| Site ID | Sample Number | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO |
|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|
| | | As (mg/l) | Lab Codes | Rev. Codes | As (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Fe (mg/l) | Lab Codes | Rev. Codes | Fe (mg/l) | Lab Codes | Rev. Codes |
| PPC-3 | 8610-124 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | U | U | .059 | D | | .075 | | |
| PPC-3(REP) | 8610-103 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | | | .059 | D | | .088 | | |
| PPC-29A | 8610-131 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | U | U | .066 | D | | .088 | | |
| PPC-30A | 8610-132 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | U | U | .036 | D | | .075 | | |
| PPC-5 | 8610-126 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | U | U | .053 | D | | .088 | | |
| PPC-5 | 8705-107 | .0090 | U | UJ | .0100 | | | .0040 | U | U | .0010 | U | U | .100 | U | U | .064 | | |
| PPC-7 | 8705-111 | .0090 | UN | UJ | .0125 | | | .0040 | U | U | .0010 | U | U | .100 | U | U | .073 | | |
| PPC-35A | 8705-117 | .0190 | A | J | .0125 | | | .0040 | U | U | .0010 | | | .100 | U | U | .064 | | |
| PPC-9 | 8705-119 | .0090 | UN | UJ | .0100 | | | .0040 | U | U | .0010 | | | .100 | U | U | .054 | | |
| PPC-9(REP) | 8705-125 | .0120 | A | J | .0125 | | | .0090 | | | .0010 | | | .100 | U | U | .035 | | |
| BLANK | 8705-123 | .0090 | UN | UJ | .0060 | U | U | .0090 | | | .0010 | | | .100 | U | U | .020 | | |
| PPC-3 | 8705-100 | .0090 | UN | UJ | .0060 | U | U | .0040 | U | U | .0010 | | | .100 | U | U | .044 | | |
| PPC-29A | 8705-101 | .0090 | UN | UJ | .0060 | | | .0040 | U | U | .0010 | | | .100 | U | U | .038 | | |
| PPC-30A | 8705-105 | .0090 | U | U | .0240 | | | .0040 | U | U | .0010 | | | .100 | U | U | .046 | | |
| PPC-31A | 8705-106 | .0090 | UN | U | .0080 | | | .0040 | U | U | .0010 | | | .100 | U | U | .048 | | |
| PPC-33A | 8705-109 | .0300 | A | J | .0125 | | | .0080 | | | .0010 | | | .083 | | | .075 | | |
| PPC-31A(REP) | 8705-126 | .0119 | N | | .0130 | | | .0040 | U | U | .0010 | | | .100 | U | U | .076 | | |
| BLANK | 8705-124 | .0090 | UN | U | .0060 | U | U | .0040 | U | U | .0010 | | | .100 | U | U | .020 | U | U |
| PPC-35A | 8610-137 | .0100 | | | .0060 | U | U | .0050 | U | U | .0010 | | | .078 | D | | .088 | | |
| PPC-7 | 8610-128 | .0100 | | | .0100 | | | .0050 | U | U | .0010 | U | U | .072 | D | | .112 | | |
| BLANK | 8610-122 | .0000 | M | | .0000 | M | | .0000 | M | | .0010 | U | U | .000 | M | | .000 | M | |
| BLANK | 8610-122 | .0000 | M | | .0000 | M | | .0000 | M | | .0010 | U | U | .000 | M | | .000 | M | |
| BLANK | 8610-123 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | U | U | .025 | U | U | .025 | | |
| PPC-9(REP) | 8610-104 | .0110 | | | .0090 | | | .0050 | U | U | .0010 | | | .047 | D | | .088 | | |
| PPC-9 | 8610-130 | .0100 | U | U | .0060 | U | U | .0050 | U | U | .0010 | | | .050 | D | | .088 | | |
| PPC-33A | 8610-135 | .0110 | | | .0060 | U | U | .0050 | U | U | .0010 | U | U | .025 | U | U | .075 | | |
| PPC-38A | 8708-70 | .0360 | | | .0350 | | | .0006 | | | .0010 | U | U | .042 | D | | .060 | | |
| PPC-8 | 8708-64 | .0170 | | | .0190 | | | .0003 | J | | .0010 | U | U | .062 | D | | .069 | | |
| PPC-8(REP) | 8708-50 | .0160 | | | .0200 | | | .0005 | J | | .0010 | U | U | .048 | D | | .078 | | |
| PPC-6 | 8708-60 | .0220 | | | .0210 | | | .0003 | J | | .0010 | U | U | .048 | D | | .048 | | |

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Table 1. Continued.

| Site ID | Sample Number | CLP | | | | ASRCO | | | | CLP | | | | ASRCO | | | | CLP | | | | ASRCO | | | |
|------------|------------------|--------------|--------------|--------------|------|--------------|--------------|----------------|------|--------------|--------------|--------------|------|--------------|--------------|----------------|------|--------------|--------------|--------------|------|--------------|--------------|----------------|------|
| | | As (mg/l) | Lab Codes | CLP Codes | Rev. | As (mg/l) | Lab Codes | ASRCO Codes | Rev. | Cd (mg/l) | Lab Codes | CLP Codes | Rev. | Cd (mg/l) | Lab Codes | ASRCO Codes | Rev. | Fe (mg/l) | Lab Codes | CLP Codes | Rev. | Fe (mg/l) | Lab Codes | ASRCO Codes | Rev. |
| PPC-5 | 8708-57 | .0140 | | | | .0200 | | | | .0003 | J | | | .0010 | U | U | | .057 | D | | | .065 | | | |
| PPC-4 | 8708-54 | .0060 | D | | | .0067 | | | | .0002 | U | UJ | | .0010 | U | U | | .048 | D | | | .043 | | | |
| PPC-29A | 8708-53 | .0060 | D | | | .0074 | | | | .0002 | U | UJ | | .0010 | U | U | | .045 | D | | | .034 | | | |
| PPC-3 | 8708-52 | .0060 | D | | | .0090 | | | | .0002 | U | UJ | | .0010 | U | U | | .049 | D | | | .054 | | | |

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Table 3. Surface water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the dissolved metals Pb and Zn and sulfate. The full data set is shown.

| Site ID | Sample Number | CLP | | | ASRCO | | | CLP | | | ASRCO | | | CLP | | | ASRCO | | |
|--------------|---------------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|---------------------------|--------------|------|---------------------------|--------------|------|
| | | Pb (mg/l) | Lab Codes | Rev. | Pb (mg/l) | Lab Codes | Rev. | Zn (mg/l) | Lab Codes | Rev. | Zn (mg/l) | Lab Codes | Rev. | SO ₄ (mg/l) | Lab Codes | Rev. | SO ₄ (mg/l) | Lab Codes | Rev. |
| PPC-3 | 8610-124 | .0050 | U | U | .0050 | U | U | .062 | | | .062 | | | 47.0 | | | 48.0 | | |
| PPC-3(REP) | 8610-103 | .0050 | U | U | .0050 | U | U | .059 | D | | .075 | | | 54.0 | | | .0 | M | |
| PPC-29A | 8610-131 | .0050 | U | U | .0050 | U | U | .072 | | | .082 | | | 45.0 | | | 50.0 | | |
| PPC-30A | 8610-132 | .0050 | U | U | .0050 | U | U | .051 | | | .052 | | | 47.0 | | | 50.0 | | |
| PPC-5 | 8610-126 | .0050 | U | U | .0050 | U | U | .043 | | | .044 | | | 49.0 | | | 50.0 | | |
| PPC-5 | 8705-107 | .0047 | D | | .0050 | U | U | .020 | U | U | .020 | | | 14.4 | | | 31.0 | | |
| PPC-7 | 8705-111 | .0040 | D | | .0230 | | | .028 | | | .025 | | | 28.0 | | | 32.0 | | |
| PPC-35A | 8705-117 | .0042 | D | | .0050 | U | U | .027 | | | .025 | | | 19.8 | | | 34.0 | | |
| PPC-9 | 8705-119 | .0034 | D | | .0050 | U | U | .023 | | | .020 | | | 23.4 | | | 32.0 | | |
| PPC-9(REP) | 8705-125 | .0030 | U | U | .0050 | U | U | .021 | | | .025 | | | .0 | M | | .0 | M | |
| BLANK | 8705-123 | .0030 | U | U | .0050 | U | U | .020 | | | .008 | U | U | .0 | M | | .0 | M | |
| PPC-3 | 8705-100 | .0030 | U | U | .0050 | U | U | .029 | | | .030 | | | 10.3 | | | 32.0 | | |
| PPC-29A | 8705-101 | .0030 | U | U | .0050 | U | U | .030 | | | .031 | | | 18.9 | | | 32.0 | | |
| PPC-30A | 8705-105 | .0030 | U | U | .0050 | U | U | .032 | | | .030 | | | 10.0 | | | 36.0 | | |
| PPC-31A | 8705-106 | .0053 | | | .0050 | U | U | .023 | | | .020 | | | 29.2 | | | 32.0 | | |
| PPC-33A | 8705-109 | .0049 | D | | .0050 | U | U | .023 | | | .025 | | | 10.0 | U | U | 32.0 | | |
| PPC-31A(REP) | 8705-126 | .0085 | | | .0080 | | | .029 | | | .025 | | | .0 | M | | .0 | M | |
| BLANK | 8705-124 | .0030 | U | U | .0050 | U | U | .020 | U | U | .008 | | | .0 | M | | .0 | M | |
| PPC-35A | 8610-137 | .0050 | U | U | .0050 | U | U | .046 | | | .046 | | | 51.0 | | | 48.0 | | |
| PPC-7 | 8610-128 | .0050 | U | U | .0050 | U | U | .041 | | | .045 | | | 44.0 | | | 50.0 | | |
| BLANK | 8610-122 | .0000 | M | | .0000 | M | | .000 | M | | .000 | M | | .0 | M | | .0 | M | |
| BLANK | 8610-122 | .0000 | M | | .0000 | M | | .000 | M | | .000 | M | | .0 | M | | .0 | M | |
| BLANK | 8610-123 | .0050 | U | U | .0050 | U | U | .003 | D | | .008 | U | U | .0 | M | | .0 | M | |
| PPC-9(REP) | 8610-104 | .0050 | U | U | .0050 | U | U | .041 | | | .044 | | | .0 | M | | .0 | M | |
| PPC-9 | 8610-130 | .0500 | U | U | .0050 | U | U | .040 | | | .044 | | | 57.0 | | | 48.0 | | |
| PPC-33A | 8610-135 | .0050 | U | U | .0050 | U | U | .042 | | | .045 | | | .0 | M | | 76.0 | | |
| PPC-38A | 8708-70 | .0020 | | | .0060 | | | .031 | | J | .026 | | | 40.0 | H | | 41.0 | | |
| PPC-8 | 8708-64 | .0040 | | | .0090 | | | .032 | J | | .035 | | | 36.0 | H | | 38.0 | | |
| PPC-8(REP) | 8708-50 | .0030 | | | .0080 | | | .036 | J | | .039 | | | .0 | M | | .0 | M | |
| PPC-6 | 8708-60 | .0030 | | | .0120 | | | .029 | J | | .033 | | | 40.0 | H | | 33.0 | | |

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Table 3. Continued.

| Site ID | Sample Number | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO |
|---------|---------------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|-----------------|-------|--------|-----------------|--------|-------|
| | | Pb | Lab | Rev. | Pb | Lab | Rev. | Zn | Lab | Rev. | Zn | Lab | Rev. | SO ₄ | Lab | Rev. | SO ₄ | Lab | Rev. |
| | | (mg/l) | Codes | (mg/l) | Codes | (mg/l) | Codes | (mg/l) | Codes |
| PPC-5 | 8708-57 | .0040 | | | .0110 | | | .023 | J | | .021 | | | 40.0 | H | | | 36.0 | |
| PPC-4 | 8708-54 | .0020 | | | .0060 | | | .023 | J | | .031 | | | 40.0 | H | | | 36.0 | |
| PPC-29A | 8708-53 | .0010 | | | .0050 | | | .022 | J | | .026 | | | 40.0 | H | | | 33.0 | |
| PPC-3 | 8708-52 | .0010 | U | U | .0050 | | | .022 | J | | .023 | | | 40.0 | H | | | .0 | M |

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**Surface Water Data
Dissolved Metals
East Helena Smelter Site**

**Samples Used In The Paired T-Test and
Linear Regression Analysis**

Table 2. Surface water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the dissolved metals As, Cd and Fe. Only samples used in the paired t-test are shown.

| Site ID | Sample Number | CLP As (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO As (mg/l) | ASRCO Lab Codes | ASRCO Rev. | CLP Cd (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Cd (mg/l) | ASRCO Lab Codes | ASRCO Rev. | CLP Fe (mg/l) | CLP Lab Codes | CLP Rev. | ASRCO Fe (mg/l) | ASRCO Lab Codes | ASRCO Rev. |
|--------------|---------------|---------------|---------------|----------|-----------------|-----------------|------------|---------------|---------------|----------|-----------------|-----------------|------------|---------------|---------------|----------|-----------------|-----------------|------------|
| PPC-3 | 8610-124 | | | | | | | | | | | | | .059 | D | | .075 | | |
| PPC-3(REP) | 8610-103 | | | | | | | | | | | | | .059 | D | | .088 | | |
| PPC-29A | 8610-131 | | | | | | | | | | | | | .066 | D | | .088 | | |
| PPC-30A | 8610-132 | | | | | | | | | | | | | .036 | D | | .075 | | |
| PPC-5 | 8610-126 | | | | | | | | | | | | | .053 | D | | .088 | | |
| PPC-5 | 8705-107 | | | | | | | | | | | | | | | | | | |
| PPC-7 | 8705-111 | | | | | | | | | | | | | | | | | | |
| PPC-35A | 8705-117 | .0190 | A | J | .0125 | | | | | | | | | | | | | | |
| PPC-9 | 8705-119 | | | | | | | | | | | | | | | | | | |
| PPC-9(REP) | 8705-125 | .0120 | A | J | .0125 | | | | | | .0090 | | .0010 | | | | | | |
| BLANK | 8705-123 | | | | | | | | | | .0090 | | .0010 | | | | | | |
| PPC-3 | 8705-100 | | | | | | | | | | | | | | | | | | |
| PPC-29A | 8705-101 | | | | | | | | | | | | | | | | | | |
| PPC-30A | 8705-105 | | | | | | | | | | | | | | | | | | |
| PPC-31A | 8705-106 | | | | | | | | | | | | | | | | | | |
| PPC-33A | 8705-109 | .0300 | A | J | .0125 | | | | | | .0080 | | .0010 | | | .083 | | .075 | |
| PPC-31A(REP) | 8705-126 | .0119 | N | | .0130 | | | | | | | | | | | | | | |
| BLANK | 8705-124 | | | | | | | | | | | | | | | | | | |
| PPC-35A | 8610-137 | | | | | | | | | | | | | | | .078 | D | .088 | |
| PPC-7 | 8610-128 | .0100 | | | .0100 | | | | | | | | | | | .072 | D | .112 | |
| BLANK | 8610-122 | | | | | | | | | | | | | | | | | | |
| BLANK | 8610-122 | | | | | | | | | | | | | | | | | | |
| BLANK | 8610-123 | | | | | | | | | | | | | | | | | | |
| PPC-9(REP) | 8610-104 | .0110 | | | .0090 | | | | | | | | | | | .047 | D | .088 | |
| PPC-9 | 8610-130 | | | | | | | | | | | | | | | .050 | D | .088 | |
| PPC-33A | 8610-135 | | | | | | | | | | | | | | | | | | |
| PPC-38A | 8708-70 | .0360 | | | .0350 | | | | | | | | | | | .042 | D | .060 | |
| PPC-8 | 8708-64 | .0170 | | | .0190 | | | | | | | | | | | .062 | D | .069 | |
| PPC-8(REP) | 8708-50 | .0160 | | | .0200 | | | | | | | | | | | .048 | D | .078 | |
| PPC-6 | 8708-60 | .0220 | | | .0210 | | | | | | | | | | | .048 | D | .048 | |

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Table 2. Continued.

| Site ID | Sample Number | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO |
|------------|------------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------------|---------------|
| | | As (mg/l) | Lab Codes | Rev. Codes | As (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Cd (mg/l) | Lab Codes | Rev. Codes | Fe (mg/l) | Lab Codes | Rev. Codes | Fe (mg/l) | Lab Codes | Rev. Codes |
| PPC-5 | 8708-57 | .0140 | | | .0200 | | | | | | | | | .057 | D | | .065 | | |
| PPC-4 | 8708-54 | .0060 | D | | .0067 | | | | | | | | | .048 | D | | .043 | | |
| PPC-29A | 8708-53 | .0060 | D | | .0074 | | | | | | | | | .045 | D | | .034 | | |
| PPC-3 | 8708-52 | .0060 | D | | .0090 | | | | | | | | | .049 | D | | .054 | | |

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Table 4. Surface water data from East Helena Montana showing data analyzed by the EPA Contract Laboratory Program (CLP) and ASRCO for the dissolved metals Pb and Zn and sulfate. Only samples used in the paired t-test analysis are shown.

| Site ID | Sample Number | CLP | | | ASRCO | | | CLP | | | ASRCO | | | CLP | | | ASRCO | | |
|--------------|------------------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|--------------|--------------|------|---------------------------|--------------|------|---------------------------|--------------|------|
| | | Pb (mg/l) | Lab Codes | Rev. | Pb (mg/l) | Lab Codes | Rev. | Zn (mg/l) | Lab Codes | Rev. | Zn (mg/l) | Lab Codes | Rev. | SO ₄ (mg/l) | Lab Codes | Rev. | SO ₄ (mg/l) | Lab Codes | Rev. |
| PPC-3 | 8610-124 | | | | | | | .062 | | | .062 | | | 47.0 | | | 48.0 | | |
| PPC-3(REP) | 8610-103 | | | | | | | .059 | D | | .075 | | | | | | | | |
| PPC-29A | 8610-131 | | | | | | | .072 | | | .082 | | | 45.0 | | | 50.0 | | |
| PPC-30A | 8610-132 | | | | | | | .051 | | | .052 | | | 47.0 | | | 50.0 | | |
| PPC-5 | 8610-126 | | | | | | | .043 | | | .044 | | | 49.0 | | | 50.0 | | |
| PPC-5 | 8705-107 | | | | | | | | | | | | | 14.4 | | | 31.0 | | |
| PPC-7 | 8705-111 | .0040 | D | | | .0230 | | .028 | | | .025 | | | 28.0 | | | 32.0 | | |
| PPC-35A | 8705-117 | | | | | | | .027 | | | .025 | | | 19.8 | | | 34.0 | | |
| PPC-9 | 8705-119 | | | | | | | .023 | | | .020 | | | 23.4 | | | 32.0 | | |
| PPC-9(REP) | 8705-125 | | | | | | | .021 | | | .025 | | | | | | | | |
| BLANK | 8705-123 | | | | | | | | | | | | | | | | | | |
| PPC-3 | 8705-100 | | | | | | | .029 | | | .030 | | | 10.3 | | | 32.0 | | |
| PPC-29A | 8705-101 | | | | | | | .030 | | | .031 | | | 18.9 | | | 32.0 | | |
| PPC-30A | 8705-105 | | | | | | | .032 | | | .030 | | | 10.0 | | | 36.0 | | |
| PPC-31A | 8705-106 | | | | | | | .023 | | | .020 | | | 29.2 | | | 32.0 | | |
| PPC-33A | 8705-109 | | | | | | | .023 | | | .025 | | | | | | | | |
| PPC-31A(REP) | 8705-126 | .0085 | | | | .0080 | | .029 | | | .025 | | | | | | | | |
| BLANK | 8705-124 | | | | | | | | | | | | | | | | | | |
| PPC-35A | 8610-137 | | | | | | | .046 | | | .046 | | | 51.0 | | | 48.0 | | |
| PPC-7 | 8610-128 | | | | | | | .041 | | | .045 | | | 44.0 | | | 50.0 | | |
| BLANK | 8610-122 | | | | | | | | | | | | | | | | | | |
| BLANK | 8610-122 | | | | | | | | | | | | | | | | | | |
| BLANK | 8610-123 | | | | | | | | | | | | | | | | | | |
| PPC-9(REP) | 8610-104 | | | | | | | .041 | | | .044 | | | | | | | | |
| PPC-9 | 8610-130 | | | | | | | .040 | | | .044 | | | 57.0 | | | 48.0 | | |
| PPC-33A | 8610-135 | | | | | | | .042 | | | .045 | | | | | | | | |
| PPC-38A | 8708-70 | .0020 | | | | .0060 | | .031 | | | .026 | | | 40.0 | H | | 41.0 | | |
| PPC-8 | 8708-64 | .0040 | | | | .0090 | | .032 | J | | .035 | | | 36.0 | H | | 38.0 | | |
| PPC-8(REP) | 8708-50 | .0030 | | | | .0080 | | .036 | J | | .039 | | | | | | | | |

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Table 4. Continued.

| Site ID | Sample Number | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO | CLP | CLP | CLP | ASRCO | ASRCO | ASRCO |
|------------|------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------------------|--------------|---------------------------|--------------|---------------------------|--------------|
| | | Pb (mg/l) | Lab Codes | Pb (mg/l) | Lab Codes | Pb (mg/l) | Lab Codes | Zn (mg/l) | Lab Codes | Zn (mg/l) | Lab Codes | Zn (mg/l) | Lab Codes | SO ₄ (mg/l) | Lab Codes | SO ₄ (mg/l) | Lab Codes | SO ₄ (mg/l) | Lab Codes |
| PPC-6 | 8708-60 | .0030 | | .0120 | | .029 | J | .033 | | 40.0 | H | | | 33.0 | | | | | |
| PPC-5 | 8708-57 | .0040 | | .0110 | | .023 | J | .021 | | 40.0 | H | | | 36.0 | | | | | |
| PPC-4 | 8708-54 | .0020 | | .0060 | | .023 | J | .031 | | 40.0 | H | | | 36.0 | | | | | |
| PPC-29A | 8708-53 | .0010 | | .0050 | | .022 | J | .026 | | 40.0 | H | | | 33.0 | | | | | |
| PPC-3 | 8708-52 | | | | | .022 | J | .023 | | | | | | | | | | | |

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RECLAMATION RESEARCH UNIT

COLLEGE OF AGRICULTURE
MONTANA STATE UNIVERSITY, BOZEMAN 59717

TELEPHONE (406)994-4821

RECEIVED

DEC 21 1988

TO: Dave Bunte

From: Dennis Neuman *[Signature]*

QUARTER HILL
Helena, MT Office

Subject: As in ground Water (ASARCO/CLP Data)

Enclosed is the statistical analysis - paired t and regression for As in ground water where all values above 0.50mg/l were removed.

CLP mean; 0.030mg/l
ASARCO mean; 0.045mg/l
D = -0.015
upper 95 limit = 0.001
lower 95 limit = -0.031
t = -1.90
P = .0657

r = .6608
slope = 0.291 ± 0.115
intercept = 0.0170 ± 0.0087